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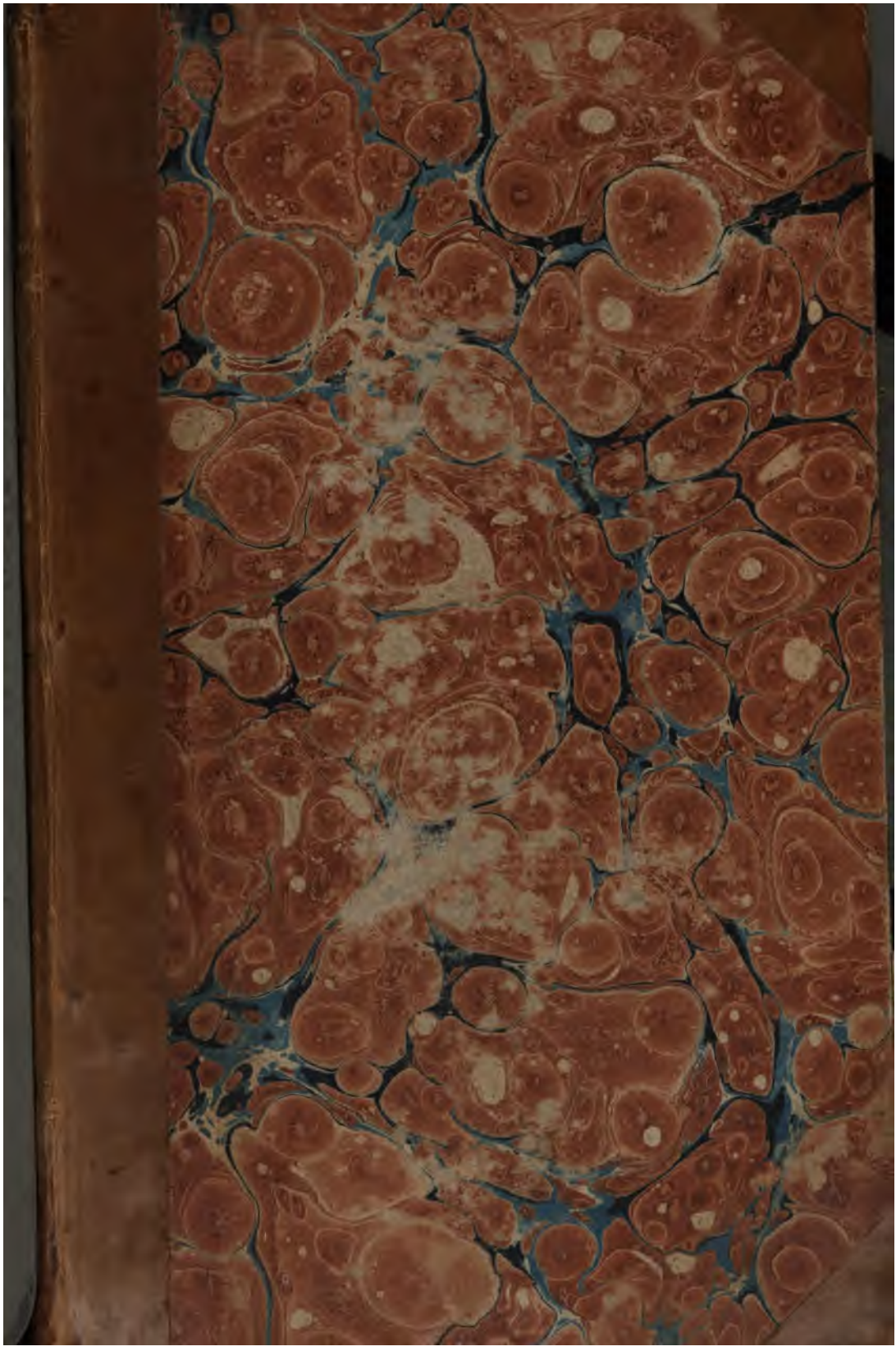

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MEDICAL REPORTS

OF

CASES AND EXPERIMENTS,

WITH

OBSERVATIONS,

Chiefly derived from

HOSPITAL PRACTICE:

To WHICH ARE ADDED,

AN ENQUIRY

INTO THE

ORIGIN OF CANINE MADNESS;

AND

THOUGHTS ON A PLAN

FOR ITS

EXTIRPATION

FROM THE

BRITISH ISLES.

BY SAMUEL ARGENT BARDSLEY, *M. D.*
M. R. M. S. Edinburgh; and M. S. London:
Physician to the Manchester Infirmary, Dispensary, Lunatic Hospital, and Asylum; and Vice-President of the Literary, and Philosophical Society, at Manchester.

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1807.

DEDICATION.

To WILLIAM FALCONER,

M. D. F. R. S. &c. &c.

DEAR SIR;

THE Reputation which you have so deservedly acquired, by your learned and valuable Writings, might have excused the Dedication of a Medical Work, from even a Stranger. But, as I am indebted to you for many kind and friendly Offices, and as the Publication of the following Pages has had the good Fortune to meet with your Approbation and Encouragement, I feel both authorized, and highly gratified, in prefixing your Name, as a Public Testimony of my Esteem, Respect, and Gratitude.

That you may long continue to promote the Cause of general Science, and the Honor and Improvement of your Profession, is the ardent Wish of,

DEAR SIR;

Your most obliged Friend,

and obedient Servant,

THE AUTHOR.

Manchester,
Chatham Street, April 2, 1807.

PREFACE.

THE Author, in the following pages, submits to the public, some part of the fruits of his observations and practice, during a period of sixteen years, at the Manchester Infirmary:—An Institution which yields to none in the Kingdom, in its extended, and liberal provision for the relief of every description of disease, to which the laboring classes of society are exposed. It has been generally admitted, that Hospitals upon a large scale, in populous districts, afford excellent opportunities for clearing up many doubtful points in the History of diseases, and likewise duly ascertaining the value of novel, as well as established modes of cure. Experiments and observations, in these Institutions, may be carried on upon an extensive, varied, and contrasted plan; and, when thought worthy of publication, the facts are deserving of that credit, which a recorded practice, open to the observation and comments of all connected with a public Hospital, so justly entitle them to receive. Whatever therefore may be thought of the value, in other respects, of the following Medical Reports, they may, at least, lay

claim to authenticity and correctness. How far indeed the Author's general inferences from the premises, and his particular observations on many of the facts, may be deemed fair and allowable, must be left for others to determine.

He has not, however, attempted to imitate the conduct of some medical writers, who, professing to treat on subjects purely practical, strenuously endeavour to establish a favorite hypothesis, to which their facts and reasonings are rendered entirely subservient. Indeed, to this idol of their fancy, they are often not only implicitly attached, but are so bigoted, as to expect an equal degree of devotion on the part of their readers.

The Author is wedded to no particular theory, nor the follower of any medical sect. Formerly a pupil in the schools of several celebrated teachers, he may have been, like many others, in the season of youthful ardour and inexperience, too much dazzled with the novelty and splendor of system, to apply to himself, with justice, the sage maxim of " Nullius addictus jurare in verba magistri." But the period of such blind attachment has been long over. He is now arrived at that sober age, and has

has been so far disciplined in the school of practice, as to be enabled to distinguish between the ingenious, but delusive speculations of the framers of systems, and the rational inductions of cautious experience.

No doubt there are but few systems of medicine which do not embrace useful and important truths. But it is the Author's opinion (which he has endeavoured to follow in practice) that the practitioner acts most wisely, who, in imitation of the conduct of Cicero, in adopting the eclectic sect of philosophy, chuses out of each of the various medical systems, such portions of their doctrine, and experience, as, in his own mind, approaches nearest the character of truth.

It may perhaps be objected to the Author, that he has reported some of the cases too much in detail. But if it be considered, that in such instances he has chiefly had in view, either the illustration of diseases imperfectly understood, or the due appretiation of novel and important remedies, there will not, he trusts, be much room for censure on this head. In the reports of *Diabetes Mellitus*, he particularly felt himself justified in transcribing such a detail

detail, from his Journal, of the cases as seemed best calculated to illustrate the symptoms and peculiar treatment of this singular and distressing malady. But, he has adopted a different method in his practical survey of Chronic Rheumatism:—A complaint, whose history and mode of cure, are, for the most part, well known and understood. He has therefore, on this subject, confined himself chiefly to a statement of the general result of his practice; except when the importance or novelty of the remedies employed, on some singular modification of the disorder, seemed to render a fuller description and explanation, not only proper, but absolutely necessary.

If the present attempt to contribute to the stock of practical information, be favorably received by his medical brethren, it is the Author's intention, as soon as compatible with his engagements, to select, for publication, a series of clinical reports, on some other diseases, chronic as well as acute, which have more particularly fallen under his observation.

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LIST OF ERRATA.

Page	Line,	
19	28	Note, *for* Dr. Dabey, *read* Dr. Darbey.
110	13	*for* the diminishing, *read* diminishing.
114	14	*for* has, *read* have.
130	24	*for* dimunition, *read* diminution.
133	1	*dele* That.
161	2	*for* Ghemical, *read* Chemical.
182	6	Table, *for* Enterites, *read* Enteritis.
212	9	*for* nine, *read* eleven.
221	17	*for* Antizimies, *read* Antizimics.
266		Note 2d, *for* humo, *read* homo.
277		Note ditto, *for* vicebatur, *read* videbatur.
298		*for* accessary, *read* accessory.

The Author trusts, that his Distance from the Press, will be admitted as an Apology for the above List of of Errata.

OF CHRONIC RHEUMATISM.

THIS is, perhaps, one of the most common of the many lingering and painful maladies that afflict mankind. It is a disease to which the poor and labouring classes are peculiarly subject, but the extent of its ravages is best ascertained by the medical attendants on large Hospitals.

Chronic rheumatism, and its varieties, form a large proportion of the medical cases which are admitted into the Manchester Infirmary; and it may be readily conceived that such cases are both numerous and severe, when it is known, that the occupation of weaving is carried on, not unfrequently by preference, and sometimes from necessity, in damp and confined cellars within the town; and that the surrounding country abounds with colliers, bleachers, dyers, and other artisans, who are necessarily exposed to sudden and great changes of temperature.

But if the poor and industrious classes of society in this neighbourhood are more than

commonly exposed to chronic rheumatism, they and their medical advisers have the consolation to find, that in the general Infirmary of the district, particular attention has been paid to furnish every means for the comfort and relief of this description of patients.

The institution of vapor and warm baths, both for general and local purposes, an electrical and galvanic apparatus, and the convenience of small, comfortable and distinct wards, are demonstrative proofs of the attention paid to the rheumatic class of patients. Under such favorable circumstances, I entered upon the task of treating the most inveterate cases of chronic rheumatism with every reasonable prospect of success.

At all events, an excellent opportunity was afforded of ascertaining the real nature of many remedies, which have been considered as efficacious in the cure, or relief, of this disorder.

It would be trifling and useless to enter into any detail of the generality of the cases which have been submitted to my care. Indeed, the history of chronic rheumatism and its treatment, are both too well known to afford an expectation of the discovery of much novelty either of principles or facts; but still I am of opinion, that the communication of the general

general result of the treatment (under circumstances favorable both for practice and accurate observation) of a large number of cases, will be likely to prove useful, by establishing on a firmer basis, some of the various modes which have been generally recommended for the cure of this disease. It will be proper to premise, that I mean to include under the term chronic rheumatism, such painful affections of the muscular fibres, membranes, and joints, as are unattended with fever, specific virus, or peculiar derangement of the stomach and bowels; and which are seldom accompanied with external tumor or inflammation, but are very liable to shift suddenly from one part to another, and are readily propagated along the course of the membranes and muscular fibres. This definition will include chronic *lumbago, sciatica,* and what has been considered a distinct disease,—*nodosity* of the joints.

No doubt the violence and inveteracy of chronic rheumatism are modified by the peculiar structure of the part which it affects. When the large joints with their ligaments, such as the hip joint, and lumbar *vertebræ* become affected, the contiguous nerves often suffer from the same cause, and a long train

of aggravated symptoms arise, which are with great difficulty subdued.

The practice therefore must be regulated according to these varying circumstances; but I think myself intitled to assert, from a large induction of facts, that the *rationale* of the practice in the cure of every species of chronic rheumatism, is in general simple and uniform. It consists in removing passive inflammation, and restoring the debilitated vessels and muscular fibres to their due tone and action. These ends are chiefly to be accomplished by topical applications, although internal remedies are by no means to be neglected.

I find from an inspection of my medical-case book, that two hundred and sixty-nine persons (exclusively of a considerable number which were of a mixed and doubtful nature) labouring under severe chronic rheumatism, have been admitted under my care as in-patients of the Infirmary.

The majority of these cases were of long standing, and had been brought from distant parts of the country to the Infirmary, as the last resource, after the usual means had failed.

I shall now proceed to offer some general practical

practical remarks on the effects of those remedies which appear to be most efficacious in the cure or relief of chronic rheumatism under its different forms; and at the same time, report a few cases to illustrate the effects of those anti-rheumatic medicines, which have not been generally introduced into practice; and, in order to bring the general result into one view, I shall furnish tables from which some useful practical conclusions may be drawn.

Warm, and Vapor Baths.

The general recommendation of the warm bath, to excite sweating, in most instances of chronic rheumatism, led me to expect great advantage from its use. Experience, however, has corrected my too sanguine expectation. When the disease had raged for a length of time, and induced both local and general debility, or when protracted deep-seated pains had infested the larger joints, as in *sciatica* and *lumbago*, I have found much harm to result from the warm bath. Sweating indeed, in such cases, relieved for the moment, but it subsequently aggravated the local as well as general symptons.

When the pains were of more recent date, and

and chiefly attacked the muscles and their membranous coverings, occasionally shifting from one part to another, and the strength was at the same time but little reduced, then a moderate use of the warm bath proved highly serviceable. If this remedy however failed to produce good effects, after one or two trials it was laid aside, as its continuance under such circumstances, uniformly tended to protract the patient's recovery. By the term *warm-bath*, I allude to water heated to an hundred degrees and upwards. But a *tepid* bath, from eighty-four to ninety, I have found an useful auxiliary in soothing pain, relaxing the stiffened joints and rigid fibres; especially in elderly patients, whose strength had been greatly reduced by the length and violence of the disorder. Still I consider both the warm and tepid bath as remedies of inferior value, when compared with the topical and sometimes general use of hot water in the form of *vapor*.

Whenever the joints were found so rigid as to be nearly immoveable, and the pain upon motion exquisitely severe, or when the muscles had become contracted and almost paralytic; and indeed, in every protracted case of the disease of the hip-joint, *lumbago*, or *sciatica*, the vapor of hot

hot water, locally and properly applied, afforded (especially in conjunction with other topical applications) a safe, and often successful remedy. The mode of applying it must be regulated according to circumstances. Our apparatus consists of a boiler, from which steam is conveyed through pipes, that are so constructed, as to admit of being conveniently applied to different parts of the body. In all obstinate affections of the joints, a pipe of nearly half-inch diameter is to be preferred, and a quarter of an hour is the shortest period for its application. It is better, as a general rule, to commence with a pipe of smaller size, and only to permit the vapor to strike upon the affected part, at some distance from its aperture. By these means an inconvenience will be avoided, which has sometimes prevented the steady application of the remedy; viz. too great irritation of the skin from an excess of heat. By degrees, the parts will be enabled to bear a considerable column of vapor, at a very small distance from the extremity of the pipe; and thus the remedy will be most likely to produce its full effect. I have entered into these particulars, concerning the local application of this remedy, from a conviction, that its advantages are not generally

rally nor sufficiently appreciated. At the same time I must observe, that it was found to act only as a powerful auxiliary. For I have in vain attempted to disperse some obstinate rheumatic affections, by relying solely on its use. My experience of the effects of the *general* vapor-bath is but limited. There have been but few cases in which I have deemed it prudent to excite the violent degree of sweating, that is the consequence of this application. But whenever it was thought necessary to produce such an effect, I found it the most certain and efficacious means that could be employed for the purpose.

Electricity; and Galvanism.

The former of these powerful agents I have long been in the habit of employing, as a remedy in obstinate rheumatic complaints. When the disease more particularly affected the muscular fibres, and was attended with torpor, rigidity, and diminution of vital heat, the application of electricity, by sparks or shocks, was often attended with manifest advantage; but it was in conjunction with the topical application of vapour, that its effects were more powerfully and beneficially exerted. The plan which I have generally pursued, is, first

first to order the diseased parts to be exposed to the action of vapor; and, during this operation, a stimulant liniment to be diligently rubbed upon their surface; and finally, the application of electricity. The operation of drawing sparks, more or less powerful, according to the state of the disease, is, in general, to be preferred to the administering of shocks. I have seen some cases of purely chronic rheumatism of several years standing, where the patients were so helpless as to be brought in a litter to the Infirmary, completely recovered by the steady, diligent, and conjoined use of these remedies, along with tonics and anodynes.

It may not be improper to state, as a caution, that the parts which have undergone the above-mentioned operations, ought to be carefully enveloped in flannel; and indeed, such a covering should be constantly worn, where the *natural heat* is any way deficient: I mention this latter circumstance, because I have seen instances, (especially in young subjects) where flannel or other warm covering aggravated the patient's sufferings, by increasing the degree of heat, when it was already too abundant. But such an excess of local temperament does not often occur in chronic

chronic rheumatism, and is generally of short duration.

My experience of galvanism in this disease, is at present rather confined. I have applied this remedy in some cases with advantage. But I have not been able to succeed in any instance where electricity, and other powerful remedies have intirely failed. It seems to be chiefly indicated, where the nervous energy, as well as muscular activity and vigor, is much enfeebled by long continued pain and in-action. In two cases of this kind, I found galvanism of great service; but not more so than what might have been expected from the application of electricity.

Topical Bleeding, and Issues.

These remedies are of essential benefit in the relief and cure of some of the most painful and harrassing species of rheumatic affections. Indeed, where the ligaments and membranes of the joints are the peculiar seat of the disease, or an enlargement of the extremities of the bones has taken place, the first attempt at relief, especially in young and vigorous subjects, should be directed to local bleeding; either by leeches, or what is to be preferred, the operation of cupping and scarifying.

scarifying. When the pain and irritation are abated by *repeated bleeding*, no time should be lost in securing a drain from the part by the aid of issues. I am enabled from numerous comparative trials, to recommend the application of a caustic in preference to the knife, for the purpose of establishing an effectual drain. The *kali purum* answers the purpose better than any other caustic which I have tried. I have seen several hip-cases, of long standing, yield to the persevering use of these means; but it was often necessary, in order to remove the rigidity and want of tone in the parts which remained, after the subsidence of the more violent symptoms, to have recourse to the combined aid of vapor and electricity. In very obstinate cases of *sciatica*, which resisted all other means of relief, I have witnessed the happiest effects from issues; but then it must be observed, that it was often necessary to surround the joint with several of these drains, and the degree of irritation and discharge, was moderated or increased, according to the obstinacy of the disease, and the strength of the patient. I have seen in a hip-joint case, three of these artificial openings succeed, when two have failed. I am completely satisfied, that want of success in the

the cure of many of these long protracted cases, is owing to the neglect of a vigorous and persevering use of the means above recommended. For they have succeeded under the steady discipline of *Hospital practice,* after their former failure under a feeble and desultory mode of application in private.

Blisters, and Rubefacients.

When the pains affected only the *fascia* and superficial fibres of the muscles, great relief was obtained by covering the affected parts with a blister; but it was frequently found more beneficial to use this remedy at a distance from the seat of the disease. Thus in some recent and slight cases of *sciatica,* a blister proved speedily and certainly useful, when applied to the inferior extremity of the thigh bone. Indeed, whenever the complaint seized upon any of the larger and deep seated muscles, at their origin near the joint, the mode of applying blisters to the inferior extremities of such muscles, and near to the points of their insertion, was found to be highly beneficial.

In every obstinate case of chronic rheumatism, where from the nature and situation of the diseased part, issues could not with safety or convenience be applied, recourse was always had

had to blisters as a substitute. But experience has taught me never to rely upon blisters, in severe cases of a local nature, when the aid of issues can be obtained. With respect to their mode of application, I have found a repetition of fresh blisters to be preferable, as producing less distress to the patient, and greater effects upon the disease, to the practice of keeping up a constant sore by stimulating the vesicated parts with blistering ointment.

The utility of rubefacients in relieving pain, and entirely removing slight instances of chronic rheumatism, was often experienced. They may be employed, according to circumstances, either in the form of liniment or plaster. When the pains were local and permanent, but not very severe, great advantage resulted from stimulating the skin and supporting the heat of the part by the aid of warm plasters. The following composition proved of excellent use in that most tedious kind of chronic rheumatism, which often attacks young females soon after the age of puberty; and is attended for the most part with stiffness and swelling of the ancle and knee joints. Indeed, wherever the disease had left a thickening and almost indurated state of the integuments, as well as rigidity of the tendons and ligaments of

of the joints, the local stimulus of this application was attended with good effect.

Epithema Stimulans,

℞: P. Gummi ammoniaci, ʒfs. Aceti scillæ ʒiij. coque simul leni igne. ad spissitatem idoneam & materiam frigefactam cola; deinde super alutâ illam extende; & Pulv: sal: ammoniæ muriat: ad libitum, superficiei inspergito—ft. Epithema.—The addition of more or less of the muriated ammonia, must be regulated according to the degree of irritation which it may be thought proper to excite. In most cases it is better to use it sparingly at first.

After the trial of numerous kinds of liquid rubefacients, with a view to relieve pain, and remove the atony of the muscular fibres, which more or less prevail in every case of chronic rheumatism, I give to the following liniment a decided preference.

℞: Linimenti saponis, ʒij
Aq. ammoniæ,
Tinct Cantharid: } āā ʒij
opii
G: Camphor, ʒi
M. ft. Linimentum.

The liniment should be diligently rubbed upon the parts affected, after the skin has been warmed and irritated by the friction of hot, dry, and coarse cloths; or the application of the flesh-brush.

In

In almost every instance where it was adviseable to employ vapor locally, but especially in *sciatica* and *lumbago*, I have directed this liniment to be diligently and plentifully rubbed in upon the parts, while they were exposed to the vapor pipe. By this method its stimulating effects were heightened, pain was abated, and the cure much accelerated.

Internal Remedies.

I must confess I have met with much disappointment in the trial of many remedies, highly recommended by practical writers for the cure of chronic rheumatism. There have been few examples, but those are certainly of an important kind, where internal medicines have singly completed the cure of very severe and obstinate cases. The internal remedies which have been most generally recommended, are of two kinds: viz. 1. sudorifics, 2. medicines of a stimulating nature, which abound in essential oils and resins. To these, mercurial preparations must be added. With respect to the use of sudorifics, I soon found that much caution was required in their exhibition. In more recent attacks, where the disease was diffused over the whole frame, and attended with violent pain and occasional

febrile accessions, much advantage was derived by exciting moderate sweating; but if this were carried to a profuse degree, not only great debility, but an aggravation of the pains ensued. In short, I can speak decidedly of the injurious effects of sudorifics, when pushed to any great extent, in every instance of severe local affection of the joints; and also in most other cases where the disease has been long continued, and the patient's constitution much debilitated. In chronic *lumbago* and *sciatica*, I have never experienced any lasting benefit to result from this mode of practice. Small doses of antimonial powder combined with calomel and opium, were certainly useful in allaying pain and irritation; but their efficacy consisted rather in palliating symptoms, than curing the disease, when of a serious and obstinate kind. The same observation will nearly apply to the use of stimulant remedies, such as *resin of guaiacum*, the class of terebrinthinates, and of essential oils. In the most aggravated instances of general chronic rheumatism, where great torpor and debility prevailed, *guaiacum* in such large doses as the stomach and bowels would bear, was found to be a powerful auxiliary; and certainly the most generally efficacious of all the internal remedies

remedies that were employed. But I have seen no instance of its complete success, when unaided by topical applications, in any species of the disease where much local injury of the joints had taken place. It acted most beneficially when exhibited in substance, well triturated with mucilage; to which was occasionally added, *Gum kino*, or *Tinct. opii*, to prevent its effects on the bowels. In many obstinate cases the ammoniated tincture of guaiacum, incorporated with mucilage, and joined to a strong decoction of bark, proved of great service, where the constitution was broken down by the violence and length of the disease. There were but few protracted cases in which the Peruvian bark was not prescribed with advantage as a tonic, especially at the close of the disease. It was, however, never administered with any other design than as an auxiliary. In future I shall certainly be induced to make a trial of this remedy as a principal mean of relief*. The propriety of employing it in the cure of *acute* rheumatism has been long sanctioned by the recommenda-

* Since writing the above, I find this practice in chronic rheumatism has been attended with success; and is strongly recommended by a writer in a periodical Journal. *See Medical and Physical Journal for November*, 1806.

tion of Dr. G. Fordyce, Dr. Fothergill, and Sir Edward Hulse, and lately so strongly confirmed by the extended and valuable experiments of Dr. Haygarth, (and I would add the testimony, if it were necessary, of my own recent experience of its superior efficacy) that there can be no reasonable distrust of the utility and safety of the practice. Now as there is no doubt of the affinity between the acute, and chronic species of this disease (the former frequently terminating in the latter) the bark would seem to be a remedy, under many circumstances, equally suited to both.

Turpentine, in every form, was an ungrateful medicine to the stomach; often impaired the appetite; and did not produce, when even duly persisted in, such salutary effects as the remedy before mentioned. I shall notice hereafter the use of mercury in one kind of chronic rheumatism, or at least in a disease nearly allied to it. There is another internal remedy which has enjoyed a very high local reputation in Lancashire; and was introduced about thirty years ago into practice, by one of the physicians of the Manchester Infirmary. It is the *Oleum Jecoris aselli* *, or Cod-liver oil, and

* I understand, however, that the oil most commonly used is obtained from another species of fish, belonging to

and was recommended to me by my late highly respected colleague and friend Dr. Percival, as deserving a fair and extensive trial in chronic rheumatism. It is a medicine so very nauseous both in smell and taste, that however disguised, many delicate stomachs cannot bear it; yet I have known this repugnance not only overcome; but, such is the power of habit, a relish for its high flavour succeeds to the original disgust. From long and repeated experience, I am enabled to speak of it as a medicine of efficacious, but limited powers. In some instances, where every other means have proved unsuccessful, it has operated in a manner so decidedly beneficial, as to excite astonishment. But, on the other hand, it has frequently failed in some of the mild, and more common rheumatic affections. The circumstances under which I have found it most advantageous, when used both externally and internally, are the following, 1st. In the chronic rheumatism of elderly persons, where the muscles and tendons have become rigid, and the joints nearly inflexible, in consequence of the disease

to the same genus, the *Gadus Molva*, or Ling; a very concise and accurate account of its introduction into practice at our Infirmary, is to be met with in a letter from Dr. Dabey, which is inserted in the 2nd vol. (last edition) of Dr. Percival's Essays.

having been brought on by excessive labor, hard fare, dampness, and cold. 2nd. In women whose constitutions have been worn out by repeated rheumatic attacks after parturition, and more especially in the decline of life. I have seen a few patients recover intirely by the exhibition of the oil; who, on their admission into the house, were unable either to preserve the body in an erect posture, or support its weight on the lower extremities. I do not intend to enter into any explanation of the *modus operandi* of this medicine in curing rheumatism. Whether it subdues the disease by exciting a specific action upon the small obstructed vessels, or whether it serves to lubricate the rigid fibres, by favoring the secretion of fat, I shall not pretend to determine; but the fact certainly is, that patients who have for some time taken this remedy, are disposed to increase in bulk and fatness, and it scarcely ever was attended with decisive advantages without producing these effects, in a greater or less degree. Warm table-beer is the vehicle for the oil, which the lower order of patients most commonly prefer. The dose was from half an ounce, to an ounce and a half, twice or thrice a-day, according to the delicacy of the patient's stomach, and the effects

effects of the medicine. It is seldom uniform in its mode of operation; sometimes it acts upon the kidneys, at others on the bowels, producing griping and *diarrhœa*. I have observed an eruption on the skin, preceded by prickling heat, in many patients, after first making use of the oil; but in a majority of cases, it produced, after a short period, none of these sensible effects. I have never found it to excite sweating, unless when taken in bed, and assisted by drinking plentifully of warm liquids. It was remarked that, if after about a fortnight's trial, no abatement of the pain or rigidity ensued, it was in vain to persist solely in the use of this remedy; but when its beneficial influence had once commenced, so slow and gradual was the progress of cure in many instances, that patients have continued to receive advantage during the whole course of six or eight months trial.

In serious rheumatic affections of the large joints, no great benefit was derived from its use, unless when joined with the local application of vapor and electricity. Indeed, as an internal remedy for chronic rheumatism, I consider it inferior in many respects to gum guaiacum, although it exceeds that and every other medicine (with perhaps one exception, which

which will hereafter be noticed) in the relief and cure of such peculiar states of the disorder as have been just described. It is of importance to remark, that this medicine has preserved its reputation in our Infirmary, nearly unimpaired, during the period of thirty years; for I find its annual consumption to have been from fifty to sixty gallons, soon after its introduction in 1776; and the quantity dispensed for many years back has seldom fallen below the above amount; the last year it exceeded forty gallons.

Arsenic.

The good effects arising from a judicious exhibition of this active and deleterious mineral, in several severe and obstinate diseases, have been long well known, and duly appreciated by medical practitioners. But the introduction of arsenic for the cure of chronic rheumatism, is comparatively of late date. An account of a successful trial of the remedy was widely dispersed, through the medium of a periodical Medical Journal*; yet the practice seems to be nearly confined to a few members of the profession, residing in Manches-

* See Medical and Physical Journal, Vol. II. p. 492, and Medical and Chirurgical Review, Vol. XII. p. 65.

ter.

ter. Mr. Jenkinson, the late ingenious house-surgeon, and apothecary to the Infirmary, is justly entitled to the merit of having first discovered the internal efficacy of arsenic, in the cure of a deplorable case of chronic rheumatism, which had resisted all the usual modes of relief. Soon afterwards, Mr. Hardman, a respectable surgeon in this town, exhibited this remedy in what was deemed an incurable case of the same disease, with marked and decisive advantage. Possessed of early information of these facts, and firmly relying upon the abilities and integrity of both these gentlemen, I was desirous, on the score of humanity, as well as œconomy, to introduce a trial of the practice into the Infirmary, in all such obstinate rheumatic cases as had resisted the usual means of relief. An opportunity soon occurred for the purpose; and the following are some of the most important cases in which the remedy was duly administered. I have not thought it necessary to enter into all the detail of the treatment of these patients, and have therefore only given abstracts from the Infirmary books, and my own private notes.

WILLIAM CHAPPEL, Æt. 11.

Admitted out-patient, October 22, 1804.

Has worked at a cotton-mill since he was five-years old.

Four years ago he was seized with an attack of acute rheumatism, which left him so debilitated and crippled, particularly in the joints of the lower extremities, as to be unable ever since to follow his employment. He is now become a miserable spectacle. The knee and ancle joints are enlarged, stiff, and exquisitely painful on motion. He is greatly emaciated, sleeps little, and his appetite has nearly failed. The muscles of the legs and thighs are shrunk, flabby, and scarcely to be traced. Blisters were ordered for each knee, and gum guaiacum, in the decoction of bark, together with pills of calomel and opium, at night, were internally exhibited.

November 1*st.*

Feels somewhat easier. The blistered parts being nearly healed, the local application of vapor was prescribed, and the medicines ordered to be continued.

8*th.*

The patient remains nearly stationary: his pain

pain is rather less; but he complains of loss of appetite and want of strength, and his night sweats have become very profuse; no sensible diminution in the swelling of the joints. The medicines to be repeated, and the affected joints to be covered with the ammoniacal epithem, in form of plaster.

19*th.*

No improvement in the local or general state of the disease having taken place in this interval, I was induced to try the effect of arsenic. He was therefore directed to take four drops of Fowler's mineral solution, (prepared according to Duncan's Edinburgh Dispensatory, p. 159. Ed. 1803.) in a dose of decoction of bark, with an equal quantity of tincture of opium, three times a day; and all local applications were ordered to be laid aside, except a simple covering of flannel.

21*st.*

The medicine has agreed well with the patient. He feels much easier: his appetite is improved; and his sweating is greatly abated.

26*th.*

Continues to amend. The pains in the night have nearly disappeared; and he is able to bear a gentle extension of the joints, and even

to

to support the weight of his body. The medicines to be repeated.

December 1*st*.

The improvement has been rapid and decisive. The appetite and strength of the patient are much increased. He is able to walk with very little assistance; and the lower extremity of each thigh bone (which was before protuberant) is now nearly reduced to its proper size; but the ancles are yet stiff and weak. As the medicine sat easy upon the stomach, and had brought on no other inconvenience than a slight degree of constipation, a gentle aperient was ordered, and the mineral solution to be administered in future without opium.

10*th*.

The patient has been daily gaining ground. He has acquired strength and flesh; and the local complaints are so far removed, as to admit of his walking a considerable distance without much pain or fatigue. The enlargement of the knee and ancle joints has completely disappeared; and except a slight degree of local debility, chiefly in the ancles, he might be considered as entirely cured. Medicines ordered to be repeated.

15*th*.

15*th.*

No rheumatic symptoms being now apparent, the patient was discharged cured.

I had the satisfaction to learn from his mother, that in a fortnight from this period, her son had returned to his employment in the cotton-mill, after a cessation from labor of four years, during which time he had been constantly confined to the house, and harrassed with pain.

JOHN FULLILOVE, *Soldier*, Æt. 31.

A home-patient, residing at No. 11, Gibralter, in Manchester, was transferred to my care, March 21, 1805, upon the change of districts. He was first admitted under the preceding physician of the district, on November 5, 1804, as a case of chronic rheumatism. The patient was suddenly attacked, more than two years ago, with catarrh and acute rheumatism, in consequence of a march into Yorkshire during a violent storm of snow. The complaint at length settled in the joints of the lower extremities; and rendered him completely a cripple. He was brought to Manchester, and placed under the care of a respectable surgeon, who (officiating for the surgeon of the regiment) attended him during several

several months; but, his complaint continuing to increase, he was made an Infirmary-patient, and immediately put upon the plan of diaphoretics and blisters, but without any sensible advantage. At this period (March 21st.) the disease is chiefly confined to the joints of the knee, ancle, and great toe of the right leg. The knee joint is much enlarged, quite rigid, and so contracted, as to bring the patient's heel nearly into contact with the back part of the thigh. The pain he feels upon any motion of the limb, is intolerably severe. The great toe appears much distorted, and even dislocated at the first joint. From confinement to bed for eighteen months past, and almost constant severe pain, night sweats, and loss of appetite, the patient's strength and flesh are deplorably reduced. His legs and thighs have lost almost every appearance of muscular texture, and his countenance is truly cadaverous. I must confess that I entertained but feeble hopes of success in this case, from any medical treatment; but, as a last resource, I immediately put the patient upon the following plan. The knee joint to be enveloped in the ammoniacal epithem before mentioned; and five drops of the arsenical solution, with an equal quantity of tincture of opium, in spirituous cinnamon

namon water, to be taken twice or thrice a-day, according to their effects; and also a diaphoretic opiate, to produce a little respite from pain in the night.

Great relief was obtained in the space of a few days, by this method. The pain became less severe, the appetite amended, and the patient passed more tranquil nights.

April 6th.

I found him this day more improved than I even expected, from the favorable reports of Mr. Thompson, (physician's clerk,) who had carefully watched the progress of the remedy. He was able to bear fifteen drops of the solution each twenty-four hours; and he observed with great satisfaction, that his pains were abated, his appetite much improved, and his sweatings nearly gone. He could now suffer the knee to be handled, and also some extension of the joint. His countenance was remarkably brightened, and he entertained sanguine hopes of obtaining a complete cure. Some slight degree of inflammation having been excited by the epithem, it was laid aside for the present. The medicines were ordered to be continued, and the patient enjoined the use of a nourishing diet, with porter at dinner.

18*th.*

18*th*.

During this interval, a gradual improvement has taken place. He can now sit upon the side of the bed, and bear the extension of the knee-joint so far, as to admit the posture of the limb to be varied. There is no external pain felt upon pressing any of the enlarged joints; and very little disturbance from this symptom at any other time.

The arsenical solution has encreased the urinary discharge; and, at the same time, brought on some degree of *heat* in the *fauces*, with a slight soreness of the gums, and increased flow of *saliva*. As these symptoms were moderate, it was thought better to restrict the exhibition of the remedy to once a day, than to omit it altogether. From this period he gradually gained the power of locomotion, the joints became more flexible, the pain vanished, and the muscles of the legs and thighs acquired some degree of plumpness and vigor. He resumed, on June the 12th, the use of the solution, in conjunction with bark, *three times a-day*, without inconvenience to his throat or gums. A perseverance in this course of medicine recovered him, so far, that on the 20th of June, he was able, with the help of a stick, to walk to the Infirmary, and was entered on the

the list of *out-patients*. On minutely examining the diseased parts, I found the toe likely to remain displaced, but the joint was intirely free from pain or swelling. His right knee and ancle were reduced to their natural size; and, except a slight degree of rigidity about the tendons of the ham, and a want of a due tone in the muscles of the leg, his recovery might be deemed complete. He was ordered to cover the part simply with a flannel roller, and continue his medicines; care being taken at the same time to obviate costiveness. His visits at the Infirmary were from this time only occasionally repeated, until the 24th of August, when he was discharged entirely cured of his rheumatic affection, and so completely established in health and strength, as to be enabled to resume his situation in the regiment. I had the satisfaction to learn from the patient, who called upon me this day, September 19, 1806, that he continues free from any return of his complaint; and is in every respect fit for active duty. From my success in the above instances, where the cartilages and heads of the bones had become enlarged by a long continuance of the disease, I was induced to try the effects of the mineral solution, in a severe and marked case of nodosity of the joints. This patient (whose case will hereafter

after be noticed) was put upon the trial of the remedy, after other means had failed. He began with five, and gradually increased the dose to eight drops, along with *Tinct. opii* twice, and sometimes thrice, a-day. The medicine agreed well with his constitution; and it was so administered, as to produce its full effect. He persisted in its use, under my constant inspection and a proper regimen, for nearly three weeks, before it was thought proper to discontinue a further trial. I have likewise ordered the solution in two other cases of mild chronic rheumatism, where the muscles and their investing membranes were the seat of complaint; but my success did not equal my expectation. The recovery of both patients, who were Females, was obliged to be expedited by calling in the aid of other remedies, as the beneficial operation of the solution was neither speedy, nor decisive. I am therefore disposed to infer (as far as my limited experience will permit) that it is only in the protracted chronic rheumatism, where the vital powers are much diminished, and the ends of the bones, periosteum, capsules or ligaments of the joints, are likewise partially affected, that the use of arsenic is likely to prove eminently successful. However, there

can

can be no doubt, from its indisputable efficacy in such instances as have already been published, of the propriety of instituting a number of comparative trials of this remedy, with others of an approved and established kind, in the cure of every variety of so prevalent and distressing a malady as chronic rheumatism. It is my intention to enter, at no distant period, upon this experimental enquiry. I feel more encouraged to this undertaking, from a conviction, the result of frequent and attentive observation, that arsenic is a safe and harmless remedy, when *prudently* administered.

Nodosity of the Joints.

A truly medical philosopher, Dr. Haygarth, is the first and only writer I am acquainted with, who has given a separate and distinct view of an affection of the joints under the above title. The complaint has been generally noticed as rheumatic-gout, and is evidently alluded to by Sauvages * under this term, although his description of the symptoms is not complete. I am however of opinion, that it is more nearly allied to chronic rheumatism

* Vide Nosolog: Method. Sauvag: Class vij Dolores. G: 111. S. 3.

than to gout. I have at this time two patients under my care, (on account of complaints of a different nature) who have long been martyrs to this dreadful malady. One is a gentleman aged sixty, who has been a cripple from thirty years of age. All the affected joints are strangely distorted, and the number of nodes (which vary in size and hardness) occupying the upper and lower extremities, amount to nineteen. He stated the disease to have come on, in consequence of using the cold bath, when he was much heated. The joints of the wrist, and fingers of the right hand, were first affected, but without exciting much attention, till at length the disease seized upon the knees, and ancles, and in a few years reduced him to a state of entire helplessness. He has no hereditary claim to the gout, and has been rather abstemious in his mode of living. His general health has been uncommonly firm and good. His appetite and spirits have seldom failed him; and, with the exception of occasional pains in the muscles, as well as the affected joints, he has passed the last twenty years of his life with ease and tranquillity.

The other patient is a lady, aged forty-five, the mother of nine children. She was first affected

fected four years ago, when the *menses* became irregular, with pain, and enlargement of the joints of the wrists. In six months the disease extended to the joints of two of the fingers of the right hand, and has lately attacked the right knee, and ancle: since which time she has not been able to walk without assistance. She was troubled with chronic rheumatism after her last lying-in, five years ago; and at present complains of shifting, and rheumatic pains in various parts of the body. She is likewise occasionally subject to a troublesome *diarrhæa*. In other respects she enjoys tolerable health. Both these patients have undergone a variety of medical treatment, without any permanent advantage. Local bleeding, and the warm-bath relieved the pain at the onset of the disease; but the patients have latterly desisted from attempting any method of relief, under a persuasion, that their complaint proceeds from gout. Indeed, in the former case, all hope of relief is at an end; in the latter, there is small chance of success, considering the peculiarity of the malady, and delicate constitution of the patient.

In treating on the effects of arsenic in chronic rheumatism, I merely alluded to the case of a patient afflicted with nodosity of the

joints, where this remedy had failed; but I shall now describe the history of this interesting case, and the method of treatment which terminated in complete success.

JAMES BAZELEY, *Æt. 22. Labourer,*
December 8, 1805.

Admitted into the Infirmary from a distant part of the country. He has been ill nine or ten months; the joints of all the fingers of both hands are enlarged, stiff, and painful. His right knee, and both ancles, have become knotty and protuberant, within these few weeks; and have rendered him incapable of walking many yards. The nodes are remarkably distinct and prominent, on the middle joints of the fingers, and exquisitely sore to the touch; but the integuments are neither inflamed nor discoloured. The patient looks wan, and emaciated, from confinement, pain, and anxiety. He was first seized with stiffness, heat, and pain in the hands and feet, after a severe day's labour, in getting turnips during inclement weather. The pains afterwards shifted to different parts of the body, and at length settled in the joints. The complaint was treated before his admission, as rheumatism; and he supposed himself getting well when the nodes appeared.

He

He was immediately put upon the arsenical solution, with an opiate at bed-time; Care being taken to obviate costiveness with castor-oil. The solution was exhibited, to the amount of five drops, three times a-day, until the 19th, without producing the slightest favorable change in the disease; indeed the nodes were rather increased in size, and so stiff and painful were the joints, as to compel the patient to keep his bed.

20th.

Being unwilling to push the experiment any farther, recourse was had to the trial of the *oleum jecoris aselli*. He was ordered to take a table spoonful twice or thrice a-day, in beer; and frequently to rub the affected joints with the oil, made warm.

30th.

The medicine having griped and purged him, a few drops of *tinct: opii*, were added to each dose, with proper effect. He has been able to get down two ounces of the oil daily, and has conquered, in some measure, his repugnance to the medicine. Still there is no visible improvement in the state of the nodes, and his pains at night are more acute than ever. Under these circumstances, the oil was ordered

ordered to be discontinued, and he was put upon the following plan.

To go into a slipper-bath each night at 100 degrees; and afterwards to take 12 grains of the Pulv: ipecac: comp: with a proper regimen, to encourage sweating. The following powder to be exhibited three times a-day.

℞ Pulv: Cort: peruv: ʒfs.
G: Guaiac: gr. x.
Ammoniæ. ppt. gr. vi. M. ft. Pulv.

January 7th.

The pains have been relieved by sweating; but the patient's strength is thereby diminished, and the swelling and hardness of the nodes not in the least removed.

The sudorific powder was ordered to be omitted. The bath to be continued; but at the reduced temperature of 94. The powders with Cort: and G: Guaiac: to be repeated.

14th.

The above method having failed, in obtaining more than a temporary respite of pain; and the nodosity of the joints being rather increased than diminished, I was resolved to try the effects of mercury, assisted by a tepid bath. As the patient's stomach and bowels were

were in too irritable a state to permit its internal use, one scruple of strong mercurial ointment, was ordered to be rubbed upon the inside of the legs and thighs each night, after the use of a slipper-bath, heated to 94 degrees.

16th.

Bark, and opium were joined to the use of the mercurial friction, as the patient feels himself remarkably debilitated.

20th.

Pains considerably abated in the knees and ancles, but the nodes of the fingers have become rather inflamed. Ordered eight leeches to the joints most affected, and a continuance of the bath, and other remedies, with half a pint of red-port, daily.

28th.

The leeches produced an abatement of pain and inflammation; but there is no reduction in the size or hardness of the nodes. The soreness of the mouth is scarcely perceptible; but, from the quickness and debility of the pulse, there can be no doubt of the constitution being affected by the ointment.

February 4th.

The patient is considerably improved within these few days. He suffers less pain The nodes

nodes are evidently softer, and the joints less rigid. He is capable of moving every limb with more freedom and ease; and sits upon the bed side for an hour together.

7th.

Has been gaining ground, though but slowly. The tendency to salivation having disappeared, the quantity of ointment was directed to be increased to half a drachm, night and morning; and the use of the tepid bath to be limited to three times a-week.

18th.

His mouth is now become very sore, and the salivary discharge is increased to nearly a pint each twenty-four hours. The nodes of the ancles and knees are greatly reduced, and those of the finger joints, are neither so hard nor so tender to the touch. The tepid bath and mercurial frictions to be continued; and an astringent with opium, occasionally administered, to check the action of the mercury on the bowels.

March 4th.

A steady and moderate degree of salivation has been supported since the 20th *ult.* and with the most *decided benefit.* The flexibility of the joints is almost restored; the nodes have

have disappeared in the knees and ancles; and only the wrist and fingers of the right hand, seem to suffer from the complaint. But, as the patient's strength is exceedingly reduced, and his stomach and bowels become so weak, as scarcely to maintain a sufficient degree of nourishment; and, as the mercurial action will of course be sometime before it subsides, the frictions were ordered to be laid aside, and a decoction of bark, with *tincture of cascarilla, and gum kino,* to be taken. A nutricious diet, with wine or porter, was likewise prescribed.

18*th.*

His strength is much recruited, and the nodes, stiffness, and pain, have nearly disappeared from every joint, except the wrist, and first and second fingers of the right hand. Leeches were therefore again applied, and ordered to be occasionally repeated, if necessary.

26*th.*

Has had leeches applied three times to each finger and wrist, with the desired effect of abating pain and inflammation. He has been able since the 10th, to walk about the ward without any aid; and is now so far recovered, that except a slight enlargement of two of the finger joints (but without the least hard-

ness

ness or pain on pressure) he is completely restored to health. On the 28th was dismissed cured.

It will scarcely, I imagine, be doubted, that the above is a genuine instance of the particular affection so ably described by Dr. Haygarth, under the term "nodosity of the joints." If this be granted, an important practical fact has been ascertained; viz. that mercury is capable of destroying the disease, when in an *incipient* state. How it is likely to succeed in more advanced stages of the disorder, when the cartilages, or the bones, have suffered long and serious injury, must be left for further experience to decide. I cannot however say, that my expectations on this head are very sanguine; but there is still the consoling prospect of administering relief by a proper use of mercury, when the disease is not too far advanced. The application of leeches, and the tepid bath, were certainly useful auxiliaries; but, it was not until the mercurial action upon the patient's system was fully exerted, that any essential change in the diseased joints took place. The subsidence of the nodes, and the progress of the salivation, kept equal pace with each other.

The history of the first and last of these three

three cases of nodosity, seems to point out a close alliance between chronic rheumatism, and this malady. Both patients suffered at first from exposure to diminished temperature, and experienced flying muscular pains previous to the attack of nodes in the joints. There was nothing like periodical or occasional remission of the symptoms, nor any internal derangement of the digestive organs, as in gout. In my original view of the disease, before I had the advantage of perusing Dr. Haygarth's account, I certainly was induced to consider it as a species of chronic rheumatism; and in the last case, exhibited mercury for its cure, in consequence of its reputation, as an *alterative* remedy in this disorder. But I am now convinced, that nothing but the influence of mercury, so as to produce a *gentle salivation*, will be likely to prove efficacious, in such a state of rheumatism, as nodosity of the joints.

TWO CASES

of a singular Affection of the Calves of the Legs.

JOHN LINDSAY, *Weaver*, Æt. 36.

April 3, 1796.

Was admitted an In-patient of the Infirmary, with the following complaint. He was seized three

three weeks ago with a violent pain in the muscles of the calf of each leg, soon after his removal from a garret into a damp cellar, where he worked. The pain was almost incessant; it was not increased by pressure; but became so severe at night, as to deprive him of sleep. The disorder was entirely confined to the parts first attacked; and was unattended with discoloration, tumor, or any external appearance of disease, except that the muscles were unusually flaccid and shrunk. He was able to walk about the wards, and conceived this exercise afforded him a temporary respite from pain. The appetite was tolerably good, and the animal functions in general but little impaired. Pulse ninety-six, and rather feeble. His countenance exhibited symptoms of uncommon anxiety and distress. I ordered the immediate application of vapor, and an anodyne, composed of antimonial powder, calomel, and opium, at bed-time. During the day, he was directed to take twice of a decoction of bark, with the volatile tincture of guaiacum, and *Tinct: opii.*

4th.

Notwithstanding he had taken one grain and a half of opium in the night, his sufferings

ings had been so dreadfully acute, that the patients in the same ward complained of being unable to sleep from his continual wailing. I examined his legs very attentively this morning, but could not discover any marks of external disease. The medicines were ordered to be repeated, and the *stimulant liniment* to be diligently rubbed upon the parts, when the usual exacerbation of pain came on in the evening.

5th.

On visiting the ward this morning, I learned with surprize, that the patient had suddenly expired last night at nine o'clock. He had applied the *liniment* at eight o'clock, when his distress was at its height; and after rubbing the parts with the same, for about a quarter of an hour, he joyfully exclaimed, that he was free from pain, and would go to bed. He had not been long there, when he was seized with slight convulsions, and immediately expired.

JAMES MANSELL, *Joiner*, Æt. 30.

February 6, 1799.

Admitted an In-patient, February 6th. He first experienced, six weeks since, a soreness in the calf of each leg, which gradually increased

creased, so as to prevent him following his employment. The pain was most severe in the night, but never intirely quitted him. He frequently has sat up the whole night in bed, endeavouring by pressure, and handling the muscles, to relieve his pain. He has not been affected with chronic rheumatism, and is totally unable to account for the origin of this disease. The pulse and most of the natural functions are regular; but the patient's countenance bespeaks great distress, and he is much reduced by pain, and want of sleep. As I could have no doubt of the similarity of the present, to the preceding unfortunate case, I entered upon its treatment with great caution. The parts were enveloped with flannel, and fomented with hot water. Leeches were also applied, and diaphoretics with opium prescribed internally. This plan was attended with no benefit. The pain increased to a distressing degree in the night, and seemed indeed, to be aggravated by opiates. Blisters were then ordered to each calf of the leg; and when the vesicated parts healed, the blisters were renewed. At the same time electrical sparks were drawn from the neighbourhood of the affected muscles; and slight shocks passed through them. Bark and Guaiacum

Guaiacum were also exhibited. By this method the pains gradually subsided; and, in three weeks, the patient was discharged entirely cured.

I have not been able to find the above singular affection referred to in any system of nosology; nor have I met with a description of it by any medical author. It resembles chronic rheumatism in many respects, but in others, it is widely different; for the pain was stationary, and its sudden cessation proved speedily fatal. It has clearly no connection with gout or palsy. I am therefore inclined to consider it as a peculiar affection of the nerves which go to supply the *gastrocnemii* muscles; and that the disease depends upon local nervous irritation, seems highly probable, both from the instantaneous departure of the pain, and the consequences which speedily followed that event. It is, indeed, inpossible to affirm, that the patient's sudden death was the immediate consequence of the application of the liniment; for so obscure are the laws of nervous sympathy, by which morbid irritation is often propagated, without any apparent cause, from one part to another of the nervous system, the most remote from each other, that nothing positive on this head can

can be ascertained. But still the connection, apparently that of cause and effect, between the topical use of the liniment, and the sudden and entire cessation of pain, terminating in fatal convulsions, ought certainly to operate as a caution against the application of a similar remedy in this singular disease.

On Chronic Rheumatism, from the Effects of Mercury.

In the course of my practice, I have met with several instances of a peculiar species of chronic rheumatism, which attacked persons while under the influence of mercury, for the cure of complaints totally unconnected with *syphilis*. The severity and peculiarity of the symptoms of this malady, and the failure in every attempt to remove them by the common anti-rheumatic remedies, together with the silence of nosological and practical writers upon the subject, have induced me to describe its history, method of treatment, and proper place in nosology. The following history of a well marked case of the disease, will sufficiently explain its character, and particular mode of treatment.

JAMES INGRAM, *Farmer's Servant, Æt.* 13.

Admitted an In-Patient, Jan. 20, 1806.

The patient was seized, six months ago, with pain, stiffness, and a benumbed sensation in the soles of his feet, and the palms, and back of his hands; in consequence of exposure to cold at the time his mouth was affected with mercury. He had been imprudently advised to rub his body with mercurial ointment, for the itch, and, notwithstanding he had brought on a slight salivation, he was sent (unconscious of his situation) into the fields to weed corn, during wet weather. The pain and other symptoms gradually increased to so violent a degree, as to incapacitate him from following his employment. The pain had regular remissions and exarcerbations. He was tolerably easy in the morning, but towards noon the pain increased, and became so severe at night, as entirely to deprive him of sleep. After a month's confinement, the complaint extended over various parts of the body; and, as it became more diffused, the pains were less excruciating, than when confined to a particular part. He tried the Buxton bath for five weeks, without any benefit. He was then placed under the care of an

eminent Surgeon, at Knutsford, who advised the warm-bath, sudorifics, and various external applications, with little or no advantage.

He is at this time reduced to an extreme degree of debility. The pains are confined, as on the first attack, to the soles of the feet, the palms, and back of the hands, and the external part of the head. He is not able to bear the least pressure on his feet, or to move the fingers without extreme torture, and the scalp is so sore as not to suffer his head to rest upon a pillow. There is a slight puffiness on the outside of his hands, but no swelling or discolouration in the other parts. He has lost his flesh and appetite, and looks very heavy and dejected from almost a total want of sleep. Pulse 103; body costive. The aponeuroses which cover the soles of the feet, palms of the hands, and the tendinous expansion of the muscles of the scalp, were evidently the chief seat of the disorder.

A tepid bath each evening, with opiates, diaphoretics, and the external application of the stimulant liniment, were at first prescribed; and in a few days calomel was added to the diaphoretic-opiate at bed time. No advantage being obtained from this plan, electrical sparks

sparks were drawn from the parts affected twice a-day. This operation rather increased than diminished the violence of the pain, and morbid sensibility of the parts. Leeches were then applied; which, producing a temporary respite from pain, were repeated four or five times, but each time with diminished effect.

February 17*th.*

The patient is now obliged to keep his bed from extreme debility, his nights are passed in incessant moaning, and he scarcely ever can enjoy a moment's repose before six o'clock in the morning. His ancles were ordered to be blistered; the ammoniacal epithem, of a moderate strength, was directed to be applied to the soles of the feet; and bark, with columbo, were exhibited as tonics, along with wine, in gruel. The tepid bath and other remedies to be discontinued.

25*th.*

No better. The soles of his feet, and scalp, were therefore cupped and scarified, and three grains of extract of *cicuta* added to the bark thrice a-day. A suspension of his sufferings was obtained by this plan for two days; but his pains then returned with increased severity. The feet and hands were now exposed to the

action of vapor; and they were immediately afterwards covered with cataplasms, composed of bread and milk, and one drachm of opium dissolved in oil.

This method was pursued until the 28th, when, finding very little abatement of the pain to have ensued, the patient was ordered to have half a drachm of strong mercurial ointment rubbed upon the inside of the legs and thighs twice a-day. All his other medicines to be discontinued. The good effects of this plan were speedily apparent. No sooner had his mouth become sore, than the pain and tenderness of his hands and feet were greatly diminished; and, he was able to enjoy uninterrupted rest for three or four hours during the night. On account of the patient's debilitated state, and from an opinion that it was not absolutely necessary to salivate him, a check was given to the mercurial action by reducing the number of frictions to one a-day. The complaint however remained stationary for about a week, and then gradually acquired renewed activity, in proportion as the impression of the mercury on the system seemed to be lessened. Mercurial frictions were therefore repeated to such an extent, that on the 16th of April, a copious salivation came on, which

was

was happily followed by an almost entire cessation of pain, and soreness in the affected parts. The patient was also able to sustain the whole weight of his body upon his feet, and to employ his hands in dressing himself. The ptyalism continued to the 30th, at which time every vestige of the complaint had disappeared. By the aid of bark, wine, nourishing diet, and the tepid bath, his strength was recruited; and in another week, he was discharged entirely cured.

The above is by no means an uncommon instance of rheumatism, brought on by a similar cause. The mercurial girdle, which is much in vogue as a cure for the itch, is often worn by country people; who, at such times, (being ignorant of the danger they incur) freely expose themselves to wet and cold, in following their usual occupations. I have likewise seen, in more than one instance, such a train of symptoms as have just been described, attack a syphilitic patient, from exposure to the action of cold, while under the influence of mercury; and at a time when the remedy had completely eradicated the *virus* from the constitution. But as in these cases the mercurial effects upon the system, had been interrupted by imprudent exposure to cold, it was again renewed

renewed under the mistaken notion, that the rheumatic symptoms depended on, or at least, were in some degree connected with, the original syphilitic taint. The practice proved successful, although the hypothesis was erroneous. For the present case sufficiently proves, that such symptoms may be ascribed solely to a sudden suppression of the action of mercury on the system, and that the proper method of cure is, to renew the application of this remedy; so that the habit may be duly impregnated with it.

Among the symptomatic species of rheumatism in nosology, there is one, viz. * *Rheumatismus Metallicus*, the 10th species of Sauvages, which might have been expected to include the disease under consideration; but this is not the case, the term being confined to those external pains which result from the poison of lead. There is another species (No. 21.) of the same nosologist, the *Rheumatismus Venereus* of Astruc, which more nearly resembles the disease in question. For notwithstanding this author imagines, that the *rheumatic* symptoms which appear after salivation, in syphilis, are the relics of the vene-

* Vide Nosolog: Sauvages: ordo 1 Class: VII. genus 111.

real

real poison; it is highly probable, that they originate solely from the peculiar influence of mercury, in readily predisposing the constitution to rheumatic pains, after any exposure to wet and cold. The disorder I have described, is therefore to be considered a new species, entirely distinct from the *Rheumatismus Metallicus*, and *Rheumatismus Venereus*, of Sauvage; and may be properly termed *Rheumatismus ex Hydrargyro*.

Inductions and Observations,

Derived from the annexed Tables, and foregoing Statement of Facts.*

1. Chronic rheumatism is a disease which affects all ages, from five to seventy, and upwards; more generally from twenty to forty, but most frequently from twenty-five to thirty. The proportion of females, attacked at this period, exceeds that of the males, by more than one-third. A large proportion of mar-

* A table was drawn up on a similar plan, with No. 1. containing an abstract of the treatment of one hundred and thirty-four female cases of chronic rheumatism; but as it exhibited no very striking difference in the result of the practice from the other table, it was not thought proper to insert it: a few peculiarities have however been adverted to in the general conclusions.

ried

ried women, between the ages of twenty-five and thirty, was affected with *lumbago* and *sciatica*, after lying-in. Nor is this fact of difficult explanation. The wives of the manufacturing poor are frequently exposed, after parturition, to a state of accumulated heat, by lying in bed, and taking (what they term) *comfortable warm drink*. After a few days spent in this manner, have elapsed, without any preparation, they enter upon either their usual domestic employments, or sit down to the wheel or the loom. It is to these causes, I have been able to trace the frequent attacks of *lumbago* and *sciatica*, which afflict poor lying-in-women.

2nd. *Lumbago* and *Sciatica* form one-sixth of the number of cases of chronic rheumatism in men, but the proportion of these local affections in women, is rather more than one-fifth. The cause of this inequality has already been stated. The frequent occurrence of *Lumbago* in men, may be attributed to the sudden and great exertions of the muscles of the loins in lifting weights, &c. and to the circumstance of the waist being generally more exposed to cold from a want of covering, than other parts of the body.

3rd. That the proportion of patients discharged

charged *curcd*, is larger in males than females. This is to be attributed to two causes. 1st. The disease in women, whose constitutions have been broken down by frequent parturition, is very difficult of cure. 2. It appears from the 2nd table, that a greater proportion of females was discharged *relieved*, than males. This happened in many instances, from excessive anxiety of the mothers to return to their young families, before the cure was completed. Their duration in the Infirmary was commonly for a shorter period than that of the men.

4th. The number of deaths was confined to males, and amounted to five only. Of these, two died from fever and exhaustion, arising from a disease of the hip-joint; one from a singular affection of the calves of the legs; and, of the remaining two, one died of *Phthisis*, and the other of *Paralysis*.

5th. The most generally efficacious remedies appear to be, Local-vapor, Electricity, Issues, Tepid-bath, Blisters, Rubefacients, Bark, and G. Guaiacum; but Mercury, Arsenic, and Ling-liver oil, exert powerful, and almost specific effects, in some species of chronic rheumatism.

6th. The ling-liver oil was more liberally used

used, and its good effects were more apparent, in the obstinate species of chronic rheumatism, which attacked women during the middle and latter periods of life, especially when their constitutions had formerly suffered from the disease, after parturition.

7th. The cure of chronic rheumatism, even under its most severe and protracted form, is not to be despaired of, provided vigorous and active remedies be duly administered. For the number completely cured, comprehending a large portion of the worst cases, amounts to more than three-fifths of the whole; and of those relieved to nearly one-third; and a great majority of the latter were in a state of convalescence, and in all probability would entirely recover.

8th. The peculiar affection of the hip-joint, which has been so ably and satisfactorily illustrated by Dr. Falconer*, is a disease of rather frequent occurrence in this district. The use of local vapor, bleeding, and caustics, with the aid of electricity or galvanism, appear to act as powerful remedies, if seasonably applied.

* See the Fifth Volume of the Memoirs of the London Medical Society.

TABLE

TABLE I.

Shewing the Result of Various Remedies, in 135 Cases of CHRONIC RHEUMATISM, and Disease of the HIP-JOINT.

No.	Age.	Species.	Remedies.	Event,	Residence in the Infirmary.
1	40	Lumbago,	Rubefacients, *Local Vapor*, *Electricity*,	Cured,	Three Weeks,
2	30	Lumbago,	*Local Vapor*, *Electricity*, Bark,	Cured,	One Month,
3	49	Lumbago,	Rubefacients, *Local Vapor*, Blisters,	Cured,	Three Weeks,
4	39	Lumbago,	Rubefacients, *Vapor*, Tepid-Bath, Calomel, and Opium,	Cured,	Three Weeks,
5	22	Lumbago,	Ammoniacal Epithem, Blisters, *Local Vapor*, Calomel,	Much Relieved,	Seven Weeks,
6	64	Lumbago,	Ammoniacal Epithem, *Local Vapor*, Calomel, Bark,	Cured,	Five Weeks,
7	38	Lumbago,	Local Vapor, Blisters, Calomel, *Ol. J. Aselli*,	Convalescent,	Seven Weeks,
8	33	Lumbago,	Rubefacients, Local Vapor, *Electricity*,	Cured,	One Month,
9	41	Lumbago,	Rubefacients, *Local Vapor*, *Electricity*, Blisters, G: Guaiac:	Relieved,	Two Months,
10	59	Lumbago,	Local Vapor, *Electricity*, Blisters, G: Guaiac:	Cured,	One Month,
11	30	Lumbago,	*Local Vapor*, Rubefacients, Bark, G: Guaiac:	Cured,	Three Weeks,
12	40	Lumbago,	Blisters, *Local Vapor*, *Electricity*, G: Guaiac: Calomel,	Relieved,	Five Weeks,
13	47	Lumbago,	Rubefacients, *Blisters*, G: Guaiac: Bark,	Relieved,	Five Weeks,
14	44	Lumbago,	*Vapor*, *Electricity*, Blisters,	Cured,	Seven Weeks,
15	40	Lumbago and Sciatica,	Rubefacients, *Local Vapor*, *Electricity*, Bark,	Much Relieved,	One Month,

TABLE CONTINUED,

No.	Age.	Species.	Remedies.	Event,	Residence in the Infirmary.
16	41	Lumbago and Sciatica,	Local Vapor, *Electricity*, G: Guaiac: Bark,	Cured,	Seven Weeks.
17	31	Lumbago and Sciatica,	*Local Vapor*, *Electricity*, *Issues*, G: Guaiac: Bark,	Cured,	Nine Weeks.
18	31	Lumbago and Sciatica,	Local Vapor, Electricity, *Issues*, G: Guaiac: Bark,	Cured,	Nine Weeks.
19	29	Lumbago and Sciatica,	*Local Vapor*, *Electricity*, Blisters, Calomel, Bark,	Cured,	Six Weeks.
20	19	Lumbago and Sciatica, Two Years,	Local Vapor, Ol. J. Asetli,	No better,	One Month.
21	30	Lumbago and Phthisis,	Blisters, Bark, Tepid Bath,	Died,	Two Weeks.
22	56	Sciatica, One Year,	Local Vapor, *Issues*, Tepid Bath, G: Guaiac: Calomel,	Much Relieved,	Five Weeks.
23	40	Sciatica, One Year,	Local Vapor, Issues, Bark,	Cured,	Five Weeks.
24	41	Sciatica,	Rubefacients, *Local Vapor*, *Leeches*, G: Guaiac:	Cured,	Five Weeks.
25	40	Sciatica, One Year,	Rubefacients, Local Vapor, *Electricity*,	Cured,	One Month.
26	30	Sciatica,	Rubefacients, Local Vapor, Leeches, Bark,	Cured,	Three Weeks.
27	30	Sciatica,	*Vapor*, *Electricity*, Issues, G: Guaiac:	Cured,	Six Weeks.
28	52	Sciatica,	Local Vapor, *Issues*, Leeches, G: Guaiac:	Relieved,	Five Weeks.
29	30	Sciatica,	*Vapour*, *Electricity*, Leeches, Bark,	Cured,	Five Weeks.
30	10	Sciatica,	*Local Vapor*, *Leeches*, Blisters, G: Guaiac: Bark,	Cured,	One Month.
31	40	Sciatica,	Local Vapor, *Issues*, Leeches. G: Guaiac: Bark,	Cured,	Seven Weeks.
32	30	Sciatica,	*Vapor*, *Issues*, Leeches, G: Guaiac: Bark,	Cured,	Five Weeks.
33	62	Sciatica,	Rubefacients, Local Vapor, Blisters, G: Guaiac: Bark,	Cured,	Five Weeks.
34	22	Chronic Rheumatism,	Rubefacients, Warm Bath, 98, G: Guaiac:	Cured,	One Month.

TABLE CONTINUED.

No.	Age.	Species.	Remedies.	Event.	Residence in the Infirmary.
35	22	Chronic Rheumatism,	Rubefacients, Warm-Bath, G: Guaiac:	Cured,	Three Weeks.
36	43	Chronic Rheumatism,	Warm-Bath, G: Guaiac: Opiates,	Cured,	Five Weeks.
37	25	Chronic Rheumatism,	Diaphoretics, G: Guaiac: Bark,	Cured,	One Month.
38	35	Chronic Rheumatism,	Rubefacients, Tepid Bath, 90, G: Guaiac: Calomel,	Cured,	Six Weeks.
39	20	Chronic Rheumatism, Two Years,	Warm Bath, *Blisters*, G: Guaiac: Calomel, Bark, Opiates,	Relieved,	Five Weeks.
40	43	Chronic Rheumatism,	Warm-Bath, G: Guaiac: Calomel,	Relieved,	Five Weeks.
41	45	Chronic Rheumatism, Three Years,	*Ol. J. Aselli*, Warm Bath,	Relieved,	Seven Weeks.
42	55	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac:	Much Relieved,	Five Weeks
43	33	Chronic Rheumatism,	Warm Bath, *Electricity*, Bark,	Cured,	One Month.
44	17	Chronic Rheumatism,	*Ol. J. Aselli*,	Relieved,	One Month
45	40	Chronic Rheumatism,	Rubefacients, Warm Bath, G: Guaiac:	Cured,	Three Weeks.
46	22	Chronic Rheumatism,	Rubefacients, Warm Bath, Bark,	Cured,	One Month.
47	36	Chronic Rheumatism,	Rubefacients, *Vapor*, G: Guaiac:	Cured,	Five Weeks.
48	39	Chronic Rheumatism,	Tepid Bath, G: Guaiac: Calomel,	Relieved,	Six Weeks.
49	50	Chronic Rheumatism,	Rubefacients, Warm Bath, Guaiac:	Cured,	One Month.
50	44	Chronic Rheumatism,	*Ol. J. Aselli*, Warm Bath, G: Guaiac:	Relieved,	Five Weeks.
51	50	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac: Opiates,	Cured,	One Month.
52	36	Chronic Rheumatism,	Rubefacients, Blisters, G: Guaiac:	Cured,	One Month.
53	48	Chronic Rheumatism, Two Years,	Turpentine, *Electricity*, G: Guaiac:	Relieved,	Five Weeks.

TABLE CONTINUED.

No	Age.	Species.	Remedies.	Event.	Residence in the Infirmary.
54	49	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac:	Cured,	Three Weeks.
55	56	Chronic Rheumatism,	Rubefacients, Tepid Bath, Turpentine, G: Guaiac,	Cured,	Six Weeks.
56	50	Chronic Rheumatism,	Rubefacients, Diaphoretics, Warm Bath,	Cured,	One Month.
57	26	Chronic Rheumatism, Two Years, with enlarged Joints,	Warm Bath, *Gentle Salivation*, Bark,	Cured,	Seven Weeks.
58	11	Chronic Rheumatism,	Diaphoretics, Tepid Bath, G: Guaiac:	Convalescent,	Six Weeks.
59	42	Chronic Rheumatism, Three Years.	Diaphoretics, W. Bath, *Ol. J. Aselli*, G: Guaiac, Calomel,	Not relieved,	Four Months.
60	56	Chronic Rheumatism,	Rubefacients, Diaphoretics, *Electricity*, Bark,	Cured,	One Month.
61	28	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac:	Cured,	Five Weeks.
62	26	Chronic Rheumatism with enlarged Joints.	Warm Bath, *Gentle Salivation*, Local Vapor, Bark,	Cured,	Seven Weeks.
63	68	Chronic Rheumatism, Four Years,	Warm Bath, Blister, Turpentine, G: Guaiac: Calomel,	Not relieved,	Two Months.
64	7	Chronic Rheumotism,	Rubefacients, Diaphoretics, Tepid Bath, G: Guaiac:	Cured,	Three Weeks.
65	36	Chronic Rheumatism,	Rubefacients, Diaphoretics,	Cured,	Three Weeks.
66	30	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac:	Cured,	Three Weeks.
67	26	Chronic Rheumatism,	Rubefacients, *Ol. J. Aselli*,	Cured,	Seven Weeks.
68	10	Chronic Rheumatism,	Rubefacients, Diaphoretics, Bark,	Cured,	Two Weeks.
69	32	Chronic Rheumatism,	Rubefacients, Warm Bath, G: Guaiac:	Cured,	Five Weeks.
70	12	Chronic Rheumatism,	Rubefacients, Diaphoretics, Warm Bath,	Cured.	Three Weeks.
71	32	Chronic Rheumatism,	Warm Bath, *Electricity*, G: Guaiac:	Cured,	Five Weeks.

TABLE CONTINUED.

No.	Age.	Species.	Remedies.	Event.	Residence in the Infirmary.
72	50	Chronic Rheumatism,	Local Vapor, *Electricity*, Tepid Bath,	Cured,	Six Weeks.
73	28	Chronic Rheumatism, with Rigidity and Enlargement of the Joints,	*Salivation*, *Vapor*, Leeches, Electricity,	Not relieved,	Nine Weeks.
74	62	Chronic Rheumatism,	Rubefacients, *Warm Bath*, Turpentine, *Calomel*,	Cured,	Five Weeks.
75	19	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac:	Cured,	Three Weeks.
76	48	Chronic Rheumatism, with Rigidity, and Enlargement of the Joints,	Local Vapor, *Electricity*, Blisters,	Relieved,	Five Weeks.
77	30	Chronic Rheumatism,	*Rubefacients*, Tepid Bath, G: Guaiac:	Cured,	One Month.
78	30	Chronic Rheumatism,	Rubefacients, Warm Bath, Diaphoretics, G: Guaiac:	Cured,	Five Weeks.
79	20	Chronic Rheumatism, with great Rigidity of the Joints,	*Ol. J. Aselli*, Electricity,	Relieved,	Two Months.
80	34	Chronic Rheumatism, Two Years,	Electricity, Warm Bath, *Ol. J. Aselli*, G: Guaiac:	Not relieved,	Seven Weeks.
81	36	Chronic Rheumatism,	Warm Bath, Diaphoretics, Bark,	Convalescent,	One Month.
82	30	Chronic Rheumatism,	Rubefacients, Warm Bath, Diaphoretics, G: Guaiac:	Relieved,	Five Weeks.
83	35	Chronic Rheumatism,	Rubefacients, Warm Bath, Bark,	Cured,	Two Weeks.
84	24	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac:	Cured,	Three Weeks.
85	21	Chronic Rheumatism,	Rubefacients, Diaphoretics, Warm Bath,	Cured,	One Month.
86	31	Chronic Rheumatism,	Rubefacients, Diaphoretics, Warm Bath, G: Guaiac:	Cured,	Three Weeks.
87	46	Chronic Rheumatism,	Rubefacients, Diaphoretics, Tepid Bath, Bark,	Cured,	One Month.

TABLE CONTINUED.

No.	Age	Species.	Remedies.	Event,	Residence in the Infirmary
88	45	Chronic Rheumatism, One Year,	Local Vapor, Electricity, Tepid Bath, G: Guaiac:	Not relieved,	Five Weeks.
89	42	Chronic Rheumatism, Two Years,	Rubefacients, *Electricity*, W. Bath, G: Guaiac: Bark, Calomel,	Much relieved,	Seven Weeks.
90	36	Chronic Rheumatism,	Rubefacients, *Ol. J. Aselli*, Tepid Bath,	Relieved,	Seven Weeks.
1	42.	Chronic Rheumatism,	Rubefacients, Tepid Bath, Diaphoretics, Bark, Calomel,	Cured,	One Month.
92	36	Chronic Rheumatism,	Rubefacients, Tepid Bath, G: Guaiac. Bark,	Cured,	Six Weeks.
93	60	Chronic Rheumatism,	Rubefacients, Tepid Bath, *Electricity*, G: Guaiac: Bark,	Cured,	Seven Weeks.
94	46	Chronic Rheumatism,	Rubefacients, Tepid Bath, *Electricity*, G: Guaiac: Bark,	Cured,	Two Months.
95	30	Chronic Rheumatism, with Joints enlarged and stiff,	*Salivation*, *Electricity*, L. Vapor, T. Bath, Blisters, Calomel,	Cured,	Nine Weeks.
96	32	Chronic Rheumatism,	W. Bath, Diaphoretics, Turpentine, G. Guaiac: Calomel,	Not relieved,	One Month.
97	20	Chronic Rheumatism,	Tepid Bath, Diaphoretics, Bark,	Cured,	One Month.
98	14	Chronic Rheumatism,	Rubefacients, Warm Bath, Sudorifics, Bark,	Cured,	Two Weeks.
99	29	Chronic Rheumatism,	Rubefacients, Warm Bath, Diaphoretics, G: Guaiac:	Cured,	One Month.
100	41	Chronic Rheumatism, with Rigidity and Enlargement of the Joints,	Ammoniacal Epithem, Blisters, G: Guaiac: Rubefacients, Local Vapor,	Cured,	Nine Weeks.
101	30	Chronic Rheumatism,	Rubefacients, W. Bath, Diaphoretics, G: Guaiac: Calomel,	Cured,	Five Weeks.
102	48	Chronic Rheumatism,	Rubefacients, Tepid Bath, Diaphoretics, G: Guaiac:	Cured,	Three Weeks.
103	30	Chronic Rheumatism,	Rubefacients, *Ol. J. Aselli*, Local Vapor,	Cured,	Five Weeks.

TABLE CONTINUED.

No.	Age.	Species.	Remedies.	Event.	Residence in the Infirmary.
104	40	Chronic Rheumatism, with Rigidity, and Enlargement of the Joints,	Salivation, *Ol. J. Aselli*, Ammoniacal Epithem, L. Vapor,	Cured,	Two Months.
105	34	Chronic Rheumatism,	Rubefacients, Tepid Bath, Turpentine, G: Guaiac:	Cured,	Five Weeks.
106	26	Chronic Rheumatism,	Rubefacients, Electricity, Warm Bath, Diaphoretics, Calomel,	Cured,	Six Weeks.
107	20	Chronic Rheumatism, One Year,	Rubefacients, T. Bath, L. Vapor, Cantharides, Blisters, G: Guaiac:	Not relieved,	One Month.
108	36	Chronic Rheumatism,	Diaphoretics, Tepid Bath, G: Guaiac:	Cured,	One Month.
109	69	Chronic Rheumatism,	Rubefacients, *Ol. J. Aselli*, W. Bath,	Cured,	Six Weeks.
110	59	Chronic Rheumatism,	Rubefacients, *Electricity*, Tepid Bath, Blisters, Bark,	Cured,	Nine Weeks.
111	11	Chronic Rheumatism with enlarged Joints.	*Arsenic*, Diaphoretics, Blisters,	Cured,	Two Months.
112	41	Chronic Rheumatism,	Rubefacients, *Ol. J. Aselli*, Tepid Bath,	Relieved,	Seven Weeks.
113	13	Chronic Rheumatism, *from the Effects of Mercury*,	W. Bath, *Salivation*, Sudorifics, Calomel, Leeches, Cataplasms, Vapor, Electricity, Opiates,	Cured,	Four Months.
114	31	Chronic Rheumatism, One Year and a Half, with enlarged and stiff Joints,	*Arsenic*, Ammoniacal Epithem, Diaphoretics, Blisters, Bark,	Cured,	Months.
115	19	Chronic Rheumatism, *from the Effects of Mercury*,	*Salivation*, Ol. J. Aselli, W. Bath, Leeches, G: Guaiac:	Cured,	Eight Weeks.
116	30	Chronic Rheumatism, *from the Effects of Mercury*,	*Salivation*, Warm Bath, Leeches, G: Guaiac:	Cured,	Ten Weeks.
117	42	Paraplegia after Chronic Rheumatism,	Rubefacients, *Electricity*, Bark, Opium,	Cured,	Seven Weeks.

TABLE CONTINUED.

No.	Age.	Species.	Remedies.	Event.	Residence in the Infirmary.
118	28	Paraplegia after Chronic Rheumatism,	Rubefacients, *Electricity*, *Blisters*, Cantharides, Bark,	Cured,	Two Months.
119	24	Paraplegia after Chronic Rheumatism,	Rubefacients, *Vapor*, *Electricity*, Bark, G: Guaiac:	Cured,	Three Months.
120	25	Paraplegia (One Year) after Chronic Rheumatism,	*Electricity*, *Blisters*, Calomel, G: Guaiac: Bark,	Relieved,	Six Weeks.
121	32	Paraplegia with Chronic Rheumatism, Two Years,	Electricity, Local Vapor, Blisters, Cantharides, Bark,	Died,	Three Months.
122	14	Hip Joint Case (Abcess formed)	Issues, Local Vapor, Bark,	Died,	Seven Weeks.
123	22	Hip Joint Case,	*Issues*, *Local Vapor*, *Leeches*, Bark,	Cured,	Seven Weeks.
124	26	Hip Joint Case, 1½ Year, Abcess formed,	Issues, L. Vapor, Leeches, Bark,	Died,	Five Weeks.
125	30	Hip Joint Case,	*Issues*, Electricity, *Leeches*, Bark, G: Guaiac:	Much relieved,	Seven Weeks.
126	40	Hip Joint Case,	*Issues*, Electricity, *Vapor*, Bark, Opium,	Much relieved,	Six Weeks.
127	22	Hip Joint Case, One Year,	*Issues*, *L Vapor*, Electricity,	Much relieved,	Seven Weeks.
128	20	Hip Joint Case,	*Issues*, *L. Vapor*, Leeches, Bark,	Cured,	Two Months.
129	20	Hip Joint Case,	*Issues*, *L. Vapor*, W. Bath, *Leeches*, Bark, Calomel,	Convalescent,	Three Months.
130	15	Hip Joint Case,	*Issues*, *L. Vapor*, Electricity, Bark,	Cured.	Six Weeks.
131	27	Hip Joint Case,	*Issues*, *L. Vapor*, *Leeches*, Bark, Calomel,	Relieved,	Three Months.
132	7	Hip Joint Case,	*Issues*, *Vapor*, Electricity, W. Bath, Leeches, Bark,	Relieved,	Seven Weeks.
133	22	Nodosity of the Joints,	*Arsenic*, Ol. J. Aselli, *Salivation*, *Leeches*,	Cured,	Thirteen Weeks.
134	50	Singular Affection of the Calves of the Legs,	Rubefacients, Bark, G: Guaiac: Opium,	Died suddenly,	Two Days.
135	34	Singular Affection of the Calves of the Legs,	Fomentations, Diaphoretics, Opium, *Blisters*, *Electricity*, Bark, G: Guaiac:	Cured,	Three Weeks.

N. B. The Remedies marked by *Italics*, are to be considered as entitled to a decided Superiority over the rest, in the Relief, or Cure, of the respective Cases.

TABLE II.

Exhibiting the Age, Sex, and Termination of 258 Cases of Chronic Rheumatism, and 11 Hip-Joint Cases.

Ages,	Males,	Cured,	Relieved,	Not relieved,	Dead,	Females,	Cured,	Relieved,	Not relieved,	Dead,
5 to 10	4	3	1			3	3			
10 to 15	7	5	1		1	5	3	2		
15 to 20	10	4	4	2		27	17	8	2	
20 to 25	12	9	3			13	9	4		
25 to 30	27	21	3	1	2	37	20	14	3	
30 to 35	16	12	1	2	1	8	3	1	4	
35 to 40	21	14	7			14	3	9	2	
40 to 45	15	7	6	2		9	3	3	3	
45 to 50	13	9	3		1	7	4	3		
50 to 55	1		1			8	4	4		
55 to 60	4	3	1			2			2	
60 to 65	3	3								
65 to 70	2	1		1		1		1		
Total,	135	91	31	8	5	134	69	49	16	

DIABETES MELLITUS.

IT is only of late that any consistent and rational attempts have been made to explain the phenomena of this singular and obstinate disease, and to establish a proper mode of cure. To the antients we are indebted for little more than a history of the disorder, by Aretæus; which has been faithfully transcribed by all subsequent systematic writers, without addition or improvement, till the time of Dr. Willis. This writer first pointed out the remarkable properties of sweetness to the taste, and honey-like smell, in diabetic urine; and thus, by establishing a more decided and specific character of the disease, subsequent practitioners were enabled to distinguish it from many others, with which it had formerly been confounded. Hence, since Dr. Willis's discovery, diabetes has been more frequently noticed; and this, I imagine, has given rise to the erroneous hypothesis, of its being a more common disease in modern*, than in ancient

* Many writers assuming the fact of its more frequent appearance at present than formerly, ascribe it to the immoderate use of spirituous liquors, and the greater prevalence

ancient times. No further improvement in its history, or theory, seems to have taken place, until Dr. Dobson discovered, by chemical analysis, the existence of sugar in diabetic urine; and also pointed out the sweet taste, and wheyish appearance in the serum of the blood. From hints which he derived from Dr. Cullen, and his own experiments, he was led to consider diabetes as a species of imperfect digestion and assimilation. This idea of the nature of the disease was adopted, confirmed, and further extended by Dr. Home. He may be said to have first opened the mine which Dr. Rollo and Mr. Cruickshank have so successfully explored. Dr. Home seems indeed to have erred, in not steadily adapting his practice to his theory, and in too hastily considering both the one and the other as defective, if not nugatory, merely from his want of success in two cases of very long standing.

To the ingenuity and industry of Dr. Rollo, and his coadjutor, Mr. Cruickshank, in the treatment of diabetes, every praise is certainly due. For Dr. Home had abandoned the field

prevalence of every species of enervating luxury: But neither the fact nor the hypothesis have been sufficiently established.

of

of enquiry to future practitioners; but Dr. Rollo judiciously pursued the tract of his predecessor, which, in the end, led him to success. This success may be attributed to the revival of the practice which Dr. Home justly takes credit to himself for having first adopted; viz. The employment of animal diet, and alkalies, with a view to their specific operation as septics. Indeed, this idea of preventing the formation of sugar, by the abstraction of vegetable food, and of establishing a more perfect assimilation throughout the whole system, by the rigid use of animal diet, and medicinal septics, forms the principal part, if not the entire basis of Dr. Rollo's plan. To this author then, we owe the revival of a practice, which had fallen into disuse, and would probably have sunk into entire oblivion, had not he, by the publication, and extended circulation of Captain Meredith's case, (in which Dr. Home's * principles and practice are

* Besides the defects in the assimilating powers in diabetes, Dr. Rollo supposes that there is an increased action and secretion in the stomach, with a vitiation of the gastric fluid; and in consequence of this peculiar condition of the stomach, sugar, or matter possessing saccharine properties, is copiously formed. This seems to be a gratuitous hypothesis, and is only, in my opinion, an

are judiciously applied and improved) roused the attention of practitioners to the subject; and enabled them to form more correct notions of the nature and treatment of diabetes.

This is by no means a common disease, for I believe, there are many practitioners, who have the care of extensive public Hospitals, to whom cases of diabetes have never occurred *. It has been my lot to see several instances

an attempt to explain what is obscure, by a something, more obscure: for Dr. Rollo candidly confesses, that the peculiar or specific conditions of this morbid action of the stomach, and its secretions, are not only clouded in obscurity, but must remain so, until the physiology of healthful digestion is properly explained and established. The theory of defective assimilation will sufficiently account for the existence of saccharine matter in the urine, and other fluids. This characteristic symptom, as well as the other leading ones, which enter into Dr. Rollo's definition of diabetes, is clearly and satisfactorily (at least to my mind) explained by Dr. Dobson and † Dr. Home, in their application of the facts to their own doctrine.

* An eminent physician, Dr. Storer, of Nottingham, mentions (in a letter to Dr. Rollo) his not having met a single instance of diabetes during sixteen years that he had the care of an Infirmary, containing, upon an annual average, fifty-two in-patients, and three hundred out-patients. In the Manchester Infirmary, where the

† See Medical Observations, Vol. V. p. 298.

yearly

instances of the kind; and I have endeavoured to avail myself of the principles and practice laid down by Dr. Rollo, and other writers, on the treatment of this stubborn, and too often fatal disease; with what success, will be seen in the sequel.

I shall now proceed to give an abstract from my Infirmary register, and private notes, of the several diabetic cases which have fallen under my care. Two of them, which were lately admitted, at the same time, into the Infirmary, have afforded me a favorable opportunity of comparing the result of different modes of practice, and establishing, very satisfactorily, some important conclusions. With these patients I took much pains, and I feel myself justified in reporting their cases more at large.

yearly average number of patients, belonging to different classes, may be calculated at not less than 6,500, there does not (from every inquiry I have been able to make) appear to have been admitted, during the sixteen years of my attendance as one of the physicians, more than twenty cases of Diabetes Mellitus.

CASE I.

BENJAMIN PIGGIN, *Weaver*, Æt. 40.

Admitted an In-Patient, August 26th, 1799.

Complains of a troublesome cough, pain in the right side, and considerable thirst. Has gradually lost flesh, and is so far debilitated, as to be unable to follow his employment; pulse 102. Body somewhat costive, appetite not much impaired. Considering this to be a case of incipient Phthisis; digitalis, opiates, a blister, and milk diet, were prescribed.

27th.

Cough easier, pain in the side abated, and the pulse reduced to 90.

31*st.*

On examining the patient more minutely, on account of his extreme debility, and emaciation, (which far exceeded what might have been expected to arise from the symptoms already enumerated) he then, for the first time, mentioned having noticed a large increase in the quantity, and change in the quality, of his urine. Its peculiar smell first led him to discover, that it had a taste like honey. He had undergone various hardships, and had been addicted to dram drinking; but his

his health had sustained no material injury, until about three months ago, when he suffered exceedingly from a harrassing journey out of Norfolk, on foot, during wet weather; and which he considered as the origin of his present malady. Upon examining the urine, it was found to be of a pale straw colour, and had a sweet taste, and faintish violet odour. The quantity varied, from six to eight pints, in the twenty-four hours, according to the amount of the liquids he drank. His mouth was clammy, skin hot, and rather dry, and his countenance expressed great anxiety. He could give no account of the exact time when the diabetic symptoms first appeared, but supposed it was about a month since he first noticed the sweetness of his urine.

Having at this period been casually iuformed, by a medical friend, of the great advantages derived from a strict adherence to animal diet, in the case of diabetes, recorded by Dr. Rollo; I ordered the patient strictly to abstain from bread and vegetables of every kind, and to live solely on broth and animal food. A bolus, composed of five grains of rhubarb, with one grain of opium, was ordered every night, and five grains of assafœtida, and ten

grains

grains of extract of bark, made into pills, three times a-day.

September 3rd.

Pulse 96. thirst and clamminess in the mouth abated, makes less urine during the night, and his sleep is longer and more refreshing.

3d,—6th.

Continues to improve in strength and general health, makes less urine, which he is confident is not so sweet as usual.

9th.

Complains of spasms in the stomach and bowels, with a sense of emptiness and sinking, is much troubled with eructations, and feels great distaste to his animal food, but is persuaded rigidly to persist in its use. Tinct. Ferri mur. ordered along with his other medicines.

11th.

The spasms in the stomach not having yet disappeared, three grains of the *Extractum cicutæ* were joined to each dose of the pills. His appetite is become more regular, and his urine neither so sweet, nor so much in quantity.

18th.

The spasms in his stomach are much relieved, his strength and looks improved, he has

has gained flesh considerably within the last week, and the diabetic symptoms have nearly vanished. He says his urine has lost its sweetness; and does not equal the amount of his drink. He can now sleep during the night, without a call to make water, and estimates its quantity from three to four pints daily. He was put upon the common diet of the house, and ordered to continue the use of his medicines.

27th.

Has gradually improved in his strength and appearance, and is ordered to be discharged cured, at the next weekly board.

REMARKS.

This appears to be an instance of diabetes mellitus, under its mildest form. There was neither canine appetite, extreme dryness and harshness of the skin, nor acid taste, and viscid appearance of the saliva, as in the severe, and more strongly marked cases of diabetes. Perhaps the emaciation, and feverish heat, may in part be attributed to the pulmonic affection, which had preceded, and still accompanied the diabetic symptoms. The history of the case must indeed be considered as incomplete, for the urine was not evaporated,

rated, nor its residuum examined, and no regular method was adopted to ascertain the quantity, and relative proportion of the *ingesta* and *egesta;* still however, from the colour, taste, and smell of the urine, and its increased quantity, no doubt can be entertained of the nature of the complaint. I have no reason to suspect the patient of either error or falshood in the description of his symptoms, nor of irregularity in his attention to the sole use of animal diet. It is to this regimen I would attribute the speedy recovery of the patient; but at the same time it must be admitted, that the phenomena of the disease were not so accurately ascertained, nor the practice sufficiently uniform and simple*, to admit of a positive inference, as to the efficiency of animal diet, in curing this patient. For it may be contended, that such powerful remedies as bark, opium, steel, and cicuta, are adequate singly, but especially if combined, to the removal of a slight diabetic affection. My own subsequent experience, however, and the frequent failure of tonics and antispasmodics, in counteracting this

* My knowledge of diabetes, at this time, was very limited, and I had not been fortunate enough to meet with Dr. Rollo's interesting publications.

disease,

disease, especially when the saccharine impregnation of the urine had existed for any length of time, incline me to ascribe the success, in this case, to the effects of abstinence from vegetable, and the employment of animal diet. No doubt the other remedies proved useful in restoring the tone of the system, and relieving occasional symptoms. The *cicuta* was evidently beneficial in allaying the spasmodic affection of the stomach and bowels; which, more or less, is to be met with in every instance of genuine diabetes. As I was informed of the patient's intention to return into Norfolk, I obtained a promise from him, that in case of a relapse, he would acquaint me with the fact, and enter into some particulars of his health. I have heard no tidings of him, and therefore am willing to hope, that he has remained free from any diabetic complaint.

Case II.

Mary Middleton, Æt. 30. *Unmarried.*

Admitted an In-Patient, March 15th, 1800.

Complains of a great flow of urine, especially during the night, which is of a pale colour, and has a smell, (according to her own

own expression) "resembling sweet flowers". Thirst unquenchable, with a dry hot skin, and at times, she feels intolerable heat in her stomach, and bowels.

The quantity of urine, from four to five quarts each twenty-four hours, and she believes it exceeds the amount of her drink.

Pulse 96: appetite irregular, but never keen; she has long laboured under dyspeptic complaints, with a disposition to hysteria.

It is about four months since she first noticed the violent thirst, and increased urinary discharge. Her occupation is weaving, and that in a damp cellar. Has suffered much from cold, hard fare, and distress of mind, the urine (examined by myself) is of a pale straw-colour, devoid of any urinous smell, has rather a grateful odour, and a faintish sweet taste, which the patient, upon tasting, compared to weak and new small beer. She complains, that at times, the discharge is nearly involuntary.

One pint of urine yielded on evaporation only ʒiiſs. of a dark-coloured extract, totally devoid of sweetness, but not strongly impregnated with urinary salts; the *smell, at least,* was only slightly urinous.

The quantity of water discharged the first twenty-

twenty-four hours after her admission, amounted to eight pints, and a half; and the drink to six pints. An accurate register was ordered to be kept of the quantity of liquid *ingesta* and *egesta*, and the patient to be put upon a strict diet of animal food, with broths; and to take opium with rhubard, at bed time; and the bark, with bitters, and vitriolic acid, three times in the day; when very low and faint, she was to be indulged with a little spirit and water; and her bowels to be kept open with rhubarb and magnesia.

15*th*.

During this interval, the liquid *ingesta* and *egesta*, have nearly balanced each other, and are both reduced in quantity; the average not exceeding six pints in the twenty-four hours, there is little change in the colour, taste, or smell of the urine. The patient's strength and spirits seem to be recruiting.

As it was found, however, nearly impossible to restrain her from the use of tea, with bread (which she had contrived to procure by stealth) a sort of compromise was entered into, by which she was permitted to take it once a day; provided she would, in every other respect, confine herself to animal diet.

22*nd*.

22nd.—30th.

The symptoms have remained nearly stationary, except, that the quantity of urine, on some days, amounted to eight or nine pints, while on others, it did not exceed five pints and a half.

30th.

The patient complains of sickness, and indigestion, her strength continues to increase slowly; and her general appearance is far from healthy.

The medicines and regimen were repeated, an emetic was occasionally interposed to obviate indigestion, and a gentle purgative to remove costiveness.

30th of March,—16th of April.

She has been gradually gaining ground, until within these few days, when the thirst and discharge of urine were both augmented; still the excess has always been on the side of the liquid *ingesta:* the register gives the following report.

April 13th.

Drink,	*Urine,*
9 pints,	8 pints,
14th.	
9½ pints,	8 pints,
15th.	
9 pints,	8 pints,

Drink,	*Urine,*
16*th.*	
10 pints,	8 pints,

The bark, and other medicines, are ordered to be discontinued, and the hepatised ammonia (prepared according to Mr. Cruickshank's directions) to the amount of five drops three times a-day, and a bolus composed of alum, tinct. of cantharides, and opium, substituted in their place.

April 16*th.*—*May* 10*th.*

During this period, the register points out only a very inconsiderable variation from the former report, with respect to the quantities of urine and drink: the qualities of the former, however, have been gradually approaching to a more natural state.

The patient's strength, looks, and general health, have also improved. Medicines and diet to be continued.

May 10*th.*—*June* 5*th.*

It appears from the register, that an extraordinary variation in the quantities of the liquid *ingesta* and *egesta,* had taken place, during this interval; on some days, the urine and drink have each reached to only three pints and a half, while on others, they have amounted

amounted to seven pints; and once so high as ten pints.

In order to promote a determination to the skin (which was still harsh and dry) she was ordered a warm bath, three nights a week. The first twenty-four hours from the patient's use of the bath (which produced a copious perspiration) the urinary discharge was diminished, from six, to four pints and a half; but subsequent trials of this remedy, did not produce the same effects, and therefore it was discontinued. The hepatised ammonia having created nausea, and heaviness, it was laid aside; and the bark, with bitters and alum, in the form of whey, resumed. She was allowed bread and milk, with potatoes to her meat at dinner, and a little porter. This alteration in the diet, did not occasion any change in the quantity or quality of the urine, which amounted to six pints in twenty-four hours; but neither the colour nor odour, were completely urinous.

5th.—20th.

With the exception of making too large a quantity of urine, she may be now pronounced convalescent; she is able to lie in bed without being disturbed more than once in the night,

her appetite is firm and regular, her spirits more cheerful, and her whole appearance denotes a speedy return to a condition of health, equal to what she has generally enjoyed.

Being herself persuaded of her entire recovery, she was very solicitous to be discharged. It was thought desirable however, for her to remain a week or two longer, for fear of a relapse; but all opposition proving vain, she was discharged cured on the 25th.

Remarks.

It is liable to doubt, whether this is to be considered an instance of the true *diabetes mellitus*. The saccharine impregnation of the urine was certainly slight, and no signs of it were discovered in the *residuum* after evaporation; which, in quantity, was inferior to what is usually obtained from this liquid, even in a healthy subject. One very important symptom indeed of well marked diabetes mellitus, was altogether wanting, viz. the voracious or canine appetite.

In hysteria, and dyspepsia, to which complaints the patient was liable, great irregularity is observable, both in quantity, and quality of the urine; but the changes are both sudden,

and

and of short duration. The increased flow, and altered appearance of the urine, in hysteria, frequently disappear after the fit, and recur upon any fresh accession; and in dyspepsia, the least irregularity in diet will modify the urinary secretion in a surprizing manner; but in the above case, the increased flow, and altered properties of the urine were permanent, and had existed with little or no variation for months.

The defect in the assimilating powers does not appear indeed, to have been far advanced, as little or no sugar was apparent in the urinary residuum; nor had there been a rapid wasting of the patient's flesh and strength.

The powers of digestion seem therefore to have been more in fault, than the deficiency of the animalizing principle.

That the animal diet greatly contributed to her restoration, can scarcely be doubted; but in what degree, it is not an easy matter to ascertain.

In the interval, from April 16th, to May the 10th, during the trial of the hepatised ammonia, the most evident, and material change, in the diabetic properties of the urine, and general improvement of the patient's health, were to be observed.

The

The practice was certainly too complex to afford decisive evidence of the efficacy of this medicine, in subduing the saccharine properties of the urine. Its effects however, in creating nausea, and injuring the appetite, prevented such a steady perseverance in its use, as might have led to a more decidedly beneficial result.

This person has removed from the neighbourhood of Manchester, and I have been unable to learn any particulars of her subsequent state of health.

Case III.

Thomas Kay, Æt. 24.

Admitted an In-Patient, September, 29, 1800.

Complains of great thirst, weakness in his loins, and an incessant inclination to make water, which is of a light colour, and very sweet taste. He first discovered the latter quality about four months ago, when being urged by extreme thirst in the night, he drank copiously of his urine, which practice he has since occasionally repeated.

His appetite is generally very voracious, and when he can indulge his inclination, he eats until the stomach is often obliged to disgorge its contents. What he throws up varies

in

in taste and smell; being sometimes sweet, but more frequently of a pungent acid taste, and odour. The saliva is white and frothy; the mouth peculiarly clammy; he has a sour taste, and the corners of his lips are covered with fur. The heat in his bowels is frequently distressing, and to use his own expression, "they seem at times burned up."

His skin is dry and shrivelled, and he seldom perspires. Pulse 80; his figure is lean and gaunt, his complexion sallow, and he has a dejected air. He enjoyed a tolerable state of health till within the last twelve months; and attributes his present malady to a frequent exposure to wet and cold, and a habit of drinking spirits.

He has frequently, when intoxicated, laid out all night in the open fields. His occupations have been various, but of late he has been employed as a labourer to bricklayers.

Upon examination, he was found to be afflicted with a painful phymosis. He has never measured the quantity of his urine for any given time, but thinks it must amount to some gallons in the 24 hours.

This being considered as an undoubted instance of Diabetes Mellitus, under its most aggravated form, an accurate register of the liquid

liquid *ingesta* and *egesta,* was ordered to be kept, and every material circumstance, connected with the progress, and treatment of the malady, to be carefully noted down. From these documents, the following abridged statement is copied.

September 30th.

One pint of urine yielded, by evaporation, two ounces and one drachm of a thick sweet syrup, of the colour and consistence of treacle.

In the last twenty-four hours, he has passed thirteen pints of urine, and drank twelve of liquids. The urine is of a wheyish colour, sweet to the taste, smells like wort, and exhibits air bubbles on the surface. This decrease in the quantity of urine, compared with what he had usually passed in the same time, he attributed to his being abridged by the nurse (from mistake) in the indulgence of his appetite for liquids.

He was directed to pursue a strict plan of animal diet, consisting of cold fat meat, with beef-tea; and to use daily, one drachm of the nitric acid, diluted with a sufficient quantity of water, as a part of his common beverage. To take five grains of rhubarb, and one of opium, each night.

A remarkable increase in the quantity of urine, and an aggravation of some of the most distressing symptoms, led to an inquiry as to the patient's strict adherence to the plan of animal diet; when it was found, that for three evenings past, he had, by a mistake of the nurse, been indulged in a liberal allowance of bread and cheese for supper, instead of cold meat.

This error was ordered to be rectified, and the greatest attention was enjoined, to confine the patient in future, solely to animal food; medicines and acid drink to be repeated.

October 8*th.*—13*th.*

10*th.*

Urine,	*Drink,*
13 pints,	12 pints,

11*th.*

8 pints,	9 pints,

12*th.*

8 pints,	9 pints,

13*th.*

8 pints,	9 pints,

This diminution in the quantity of urine (as appears from the register) was accompanied with a mitigation of the thirst, internal sense of heat, and stricture of the skin.

He

He has suffered little disturbance in the night, and finds his strength recruiting, but his urine has not quite acquired its natural smell and taste. Pulse 80, one pound of urine, yielded, by evaporation, one ounce and seven drachms of a thick tenacious extract, not quite so sweet nor so fluid as the last, and less in quantity by one drachm and a half. As he complained of griping, and soreness of the mouth and gums, from the use of the acid; it was ordered to be laid aside, and the rest of the plan to be continued.

12th,—20th.

In this interval no material change has occurred; except, that on the average, the daily quantity of liquid *egesta*, rather exceeds that of the liquid *ingesta*.

He has never passed more than eleven pints of urine, nor less than eight, in twenty-four hours. On one day, this discharge exceeded, by two pints, the liquids taken in. He complains of a tickling cough, and slight pains in the chest; to appease which, he was ordered an oily linctus, and a warm stimulating plaster. Pulse 68, urine more natural. Prescribed for daily consumption, one drachm of Kali-sulphuratum, in two pints of soft water. Regimen and opiate to be continued.

23d.

He was attacked with a violent colic, attended with rigor, which was succeeded by a hot fit. After clearing the stomach, he took a carminative opening mixture, which was ordered to be repeated, with or without an opiate, according to circumstances.

He soon obtained relief, but has suffered, every other, or third day, in a slight degree, from griping pains in his bowels, which have been always mitigated by the carminative mixture. The disorder in his bowels has generally come on after a full meal.

The quantities of urine and drink, have born nearly a relative proportion to each other; nine pints and a half form the highest, and seven pints and a half, the lowest amount of urine in twenty-four hours.

27th.

An augmentation was noticed of nearly two pints in the quantity of urine, compared with that of the preceding twenty-four hours. On being interrogated by the House-Surgeon, who suspected some irregularity on account of the change which had taken place, both in the quantity, and sensible qualities of the urine, the patient freely confessed, that he had seized

an

an opportunity to indulge privately in bread and cheese for supper.

He has been admonished of his fault, and seems determined to act with more discretion in future.

October 31st—November 12th.

November 9th. Pulse 76. Obtained, by evaporating one pound of urine, one ounce and five drachms of a thick residuum, of a mixed saccharine and urinary taste and smell; but the latter rather predominated.

The register affords nearly the same result as the last report, except that within the last four days the urine and drink have diminished to seven pints and a half; but the latter is still rather sweet.

He gains but little strength and flesh, and complains of weariness and general debility. On the 2d. he began to take a bolus, composed of half a drachm of *Kali sulphuratum,* and ginger, thrice in the day; and as he suffered from pain in the lumbar region, blisters were applied over each kidney, and the blistered parts ordered to be kept open.

This plan was continued till the 10th. when, on account of the nausea excited by the *Kali sulphuratum,* and the stationary point of debility, at which the patient remained, notwithstanding

standing the removal of the most formidable of the diabetic symptoms, an infusion of bark in lime water was substituted for the solution, and alum and gum kino were added to his opiate at bed time.

November 12*th*—30.*th*.

The urine is scarcely, if at all, sweet; and has varied little since the 12th, either in quality, or quantity. The average amount may be reckoned at eight pints each twenty-four hours.

His appetite is fickle, and for the most part puny; the clamminess and sour taste in the mouth have disappeared; the patient has been allowed a small portion of toasted bread at his dinner, without any increase of the diabetic symptoms.

He has for two or three days past, complained of a fixed dull pain in the back, underneath the right shoulder-blade, to which a warm plaster was applied.

November 30*th*—*December* 10*th*.

Continued the medicines, and the regimen. The pain under the shoulder, having gradually increased, and a tumor appearing; surgical aid was requested.

The Surgeon gave it as his opinion, that an abscess was forming, and treated the patient accordingly.

The

The urine has remained stationary in quantity and quality. He has been troubled with flying pains in his knees and ancles; for the relief of which, a stimulant liniment was ordered. On the 9th, he had transient chills and flushings, with a regular febrile paroxysm in the evening, which, together with the increased size of the tumor, sufficiently indicated the formation of matter. Under these circumstances, it was thought necessary to change his diet; milk was allowed for breakfast, and supper, and the common broths of the house, with animal food at dinner.

The bark, and anodyne to be continued.

December 12*th*—*January* 1*st*. 1801.

The symptoms have been nearly stationary within this period. The discharge of urine has been reduced, at times, to five pints within twenty four hours, but the average quantity may be reckoned at seven pints. It is improved, both in natural colour, and smell; but the patient says it has acquired a sweeter taste, since vegetable diet was entered upon. The tumor, having pointed outwards, was opened by the Surgeon, and discharged a considerable quantity of laudable pus. The bark, with vitriolic acid, and a mixture of vegetable, with animal food were continued. Pulse 80, soft and

and regular. His countenance, and general appearance, rather improved; notwithstanding the discharge from the abscess was considerable.

The excoriation, and swelling of the prepuce, are nearly gone, and the pain in his loins, and sense of internal heat, are very little troublesome. He does not appear to have gained flesh; but his spirits are good, and he expresses a full confidence of his recovery.

January 1st—February 1st.

The report of this month has varied more than the last. The register points out as much as eleven pints of urine, in twenty four hours; and the average quantity may be estimated at eight pints.

The abscess is not yet healed, but the discharge daily decreases. The bowels are with difficulty kept open, and his evening feverish paroxysms, attended with a short dry cough, have been constant and troublesome. Ordered to wear a flannel waistcoat, and to take opiates, with mucilaginous pectorals. The other medicines to be continued. On the 18th, one pint of urine afforded one ounce and six drachms of an extract, nearly resembling the last; except that there was rather more sweetness, both to the smell and taste.

His

His diet was again ordered to be restricted to animal food; but this was found difficult to accomplish, not only on account of the patient having been for some time past indulged in the agreeable article of vegetable diet, but also from the persuasion he entertained of his being already cured of his original disorder.

February 1*st.*—16th.

The patient has remained nearly stationary. His urine is natural, in appearance and smell, though (in his own opinion) rather sweet: The average quantity amounts to nine pints in a day, yet his thirst, heat, and dyspepsia are all abated. His strength is certainly increasing, the skin feels more soft and natural, and his visage is less sallow and dejected. The cough is troublesome occasionally, but without any fixed pain in the side, or purulent expectoration; yet, notwithstanding these favourable changes, his bulk is little, if any increased.

His impatience to quit the infirmary, in order to complete (what he considers to be) his cure, among his friends in the country: and his increasing aversion to any restriction of diet, have led to a compliance with his wishes; and he was accordingly discharged, relieved, on February the 16th.

REMARKS

Remarks.

This appears to be a decisive and aggravated instance of diabetes mellitus. The sweet taste and smell, and profuse discharge of the urine, thirst, dry skin, voracious appetite, and wasting of the body, with hectic fever, (all which symptoms were apparent in this patient's case) are sufficient indications of the nature of the disease.

An indulgence in spirituous liquors, and exposure to *hard fare*, cold and moisture, seem to have operated as remote causes in the production both of Piggin's and Kay's disorder.

The efficacy of animal diet, in mitigating the patient's diabetic symptoms, is sufficiently evident; and it is probable, if this case had not been complicated with a pulmonic affection, and the formation of a large abscess under the shoulder, that its termination would have been successful. For the hectic fever arising from these latter causes, contributed greatly to the patient's extreme emaciation and exhausted strength. It may therefore be presumed that the slight remains of the diabetic affection would have given way; provided the patient had strictly persisted in his regimen and diet. Indeed the changes which so remarkably followed every

irregularity in the plan of abstinence from vegetable food (especially in the first stages of the treatment of the disorder) sufficiently point out the necessity of a strict adherence to this essential part of the method of cure. The quantity of solid matter carried off by this patient's urine is very extraordinary.

It amounted, in the first experiment, to two ounces and thirty grains, troy weight, from one pint (wine measure) of the fluid.

This is nearly the largest quantity ever before collected by a similar experiment on diabetic urine; at least in all the cases hitherto published, which have come to my knowledge, there is but one instance of more than two ounces of extractive matter having been obtained from one pint of urine; but the medium quantity in even very aggravated cases of diabetes mellitus, may be fairly estimated at not more than ten drachms of solid extract.

The gross ignorance of this patient, joined to his habit of self indulgence, rendered it highly necessary to keep a constant watch upon his conduct; but in spite of every precaution, I believe he succeeded too often *latterly,* in eluding the vigilance of the man-nurse, and house apothecary.

He was strongly urged, and he promised a compliance

compliance with the request, to send occasional information of the state of his health; but since he left the infirmary, and went into a distant county, no account from him has been received; and consequently the termination of his complaint, although most likely to be unfavorable, cannot be ascertained.

CASE IV.

JOHN WILD, *Æt. 33, Labourer.*

Admitted an In-patient, April 12th, 1802.

Feels excessive thirst, an almost perpetual inclination to void sweet tasted urine, in profuse quantities, (especially during the night) great clamminess in the mouth, and soreness of the gums; much pain and weakness in the loins, with an involuntary discharge of semen after voiding his urine.

His skin is dry, hard, and extremely rough; pulse 125, weak and fluttering; and his countenance pourtrays the utmost anxiety and distress.

The emaciation is extreme, and his debility so great, that he was obliged to creep along the passages, leading to the physician's room, by laying hold of the walls for a support.

The excoriation, and swelling of the prepuce, are so considerable, as to have brought on a

phymosis. He states his urine to be as sweet as honey, and to amount to thirty pints in twenty-four hours. His appetite is so greedy, that his means are unable to gratify its longing; but after every indulgence of a full meal, he feels loaded, and sick at his stomach, and often throws up its contents, which have a sour and unpleasant taste. He has lost several of his teeth, since the soreness of his gums came on, and many others are now loose in the sockets.

He describes his mode of life to have been very irregular; sometimes faring hardly, at other times indulging to excess, especially in the use of spirituous liquors.

About seven months ago, he had worked at the harvest, and getting intoxicated, he laid himself down to sleep near a pool of water, where he continued all the night.

From this period he dates the origin of his complaint; but has only noticed the increase in the quantity of his urine, and the peculiarity of its appearance and taste, five months from the present date.

He was ordered to be put upon a diet of animal food, without the least portion of bread, or any other vegetable matter; two blisters to be applied to the region of each kidney, and the ulcerated parts to be kept open, by irritating dressings:

dressings: six drops of the hepatised ammonia, to be got down, mixed with mint water, three times a day, and also every night a bolus, containing one grain of opium, and five of rhubarb.

His thirst to be quenched with water, in which, at meals, toasted oat-cake was to be infused. The liquid *ingesta* and *egesta* to be accurately ascertained.

April 25th.

Urine	*Drink*
34 pints *(wine measure)*	27

Has eaten, at least, from three to four pounds of cold beef, but has carefully abstained from every other kind of food; slept better, and feels easier.

The urine (which was kept in a bucket) appeared of a greenish straw colour, and was clear when first voided; but on standing some time in the vessel became turbid on agitation, and looked like thick small beer; it emitted a faintish acid odour, although evidently sweet to the taste.

16*th.*

Urine	*Drink*
38 pints	36

He complained of tormenting thirst, and begged

begged to have his drink changed. Ordered weak barley water, acidulated with the *spirit: vitriol: ten:* and, to support his strength, four ounces of wine in the course of the day. The dose of *ammon: hepatisat:* was increased to ten drops, four times a day; and the opiate with rhubarb repeated. The *nitric* was afterwards substituted for the *vitriolic* acid, and constituted, when mixed with water, the common beverage of the patient.

17*th.*

Urine	*Drink*
28 pints	26

Has perspired copiously in the night; pulse reduced to 108; appetite moderate, but he begins to loathe his animal food. The sensible qualities of the urine are not much changed. One pint of this fluid yielded, on evaporation, two ounces, within half a drachm, of an extract, resembling coarse brown sugar, both in colour and taste; at the same time one pint of healthy urine, was exposed to evaporation under similar circumstances; and afforded a residuum amounting *only* to *two drachms* and twenty six grains. Medicines and diet to be continued, with the addition of broth at supper and breakfast.

17*th.*

17th.—27th.

The quantity of urine passed each twenty-four hours, within the last ten days, has greatly varied: on the 21st, thirty six pints were discharged, on the 27th only seventeen pints—these being the *maximum* and *minimum* quantities within this period; but the average amount may be estimated at nineteen pints each twenty four hours.

The liquid *ingesta* were seldom equal to the *egesta;* and the relative proportions fluctuated considerably. On the 23d, the urine measured nineteen pints, and the drink only sixteen: On the 25th, urine twenty four pints, and drink twenty six; yet these changes could not be attributed to any perceptible cause.

The patient has been almost daily improving in health and strength: his sleep is more refreshing, and prolonged (without the interruption of making water) to two hours at a time. The urine is become paler, and has lost some little of its faintish acid smell, and sweet taste. The pulse varies from eighty four to eighty eight. As he became disgusted with the hepatised ammonia, a solution of sulphurated kali, was administered as a substitute.

The bowels were to be kept open with castor oil, and his other medicines and diet to be repeated.

April

April 27th—May 8th.

During this period, and especially within these three or four days, a general amendment has taken place. The average quantity of urine has not exceeded fourteen pints in the twenty four hours, but has varied in quantity, at times, very considerably. On the first of May, it amounted to twenty two pints, and on the eighth, to no more than eight pints. The following extract from the register will point out the favorable changes which have taken place.

May 3d.

Urine,	*Drink,*
12lb.	12lb.
4th.	
11lb.	9lb.
5th.	
14lb.	16lb.
6th.	
12lb.	16lb.
7th.	
14lb.	16lb.
8th.	
8lb.	12lb.

The patient begins to feel his strength recruited, his countenance has lost its ghastly appearance, and he has evidently gained flesh,

as

as well as strength. He no longer complains of the offensive taste in his mouth, nor heat and tormenting pain in the bowels. His pulse is in general not more than eighty; indeed his *vigor* and *spirits are such* as to suffer him to be employed in assisting the patients, and performing several menial offices about the house; yet the urine has not lost its saccharine taste, although it has become, according to his own expression, "sharper and less pleasant."

The phymosis continues, but the swelling and excoriation are abated.

He still complains of occasional weakness in the loins, which is always aggravated by the involuntary seminal discharge.

The improvement has been so marked and rapid, within the last four days, that he feels assured of his speedy recovery, and begs to have an allowance of vegetable food, and is very desirous to be discharged in a short time.

May 8th—June 1st.

On the 9th, one pint of urine yielded, on evaporation, one ounce, two drachms, and forty grains of an extract of the consistence and colour of treacle; but with rather a saltish taste, and urinous smell.

Important changes for the worse have unexpectedly occurred within this period. For

on

on the 9th, the patient injured his leg severely by a fall, in running up stairs; this accident occasioned the opening to a very considerable extent of the cicatrise of an old wound upon the shin bone. At this time he expressed a longing desire to be indulged with bread and vegetables, and from an apprehension, that a refusal might induce him to obtain them surreptitiously, he was allowed a small portion with his meat.

From this period, the diabetic symptoms increased. and the average daily quantity of urine amounted to twenty pints; but the *ingesta* were nearly upón a balance with the *egesta*. Bread and vegetables were again forbidden; yet I have reason to believe that he contrived to purloin from the other patients, part of their vegetable diet.

The ulcer on the leg spread rapidly, and discharged a large quantity of ill conditioned pus.

He was now confined entirely to bed, and lost both his strength and flesh.

He was ordered to take wine, bark, and lime water, and to omit his other medicines. One of his legs becoming anasárcous, small doses of digitalis and calomel were prescribed, in conjunction with the bark. By this treatment

ment the swelling was nearly subdued, but the diabetic symptoms remained stationary. He was again ordered rigidly to abstain from vegetable food, and to drink daily a quart of fresh lime-water, mixed with milk; and to make use of a bath every night, heated to ninety-five degrees: by these means, the progress of the disease seemed at least to be arrested; but no permanent change of the characteristic diabetic symptoms was effected.

29th.

One pint of urine, taken from twenty-four pints which had been discharged on this day, was again evaporated. The residuum resembled the last in colour, consistence, and smell; and weighed one ounce, seven drachms and a half.

June 1st—July 1st.

During this month, the register points out little or no variation in the daily quantities of the liquid *ingesta* and *egesta*, when compared with the proceeding fortnight: twenty-six pints was the greatest, and eighteen the smallest quantity of urine discharged on any one day: the ulcer on the leg, so far from being healed, has assumed a phagedenic appearance, and excites much pain and inconvenience—alum with galls, and opium, were prescribed at bed time, in

in addition to the bark and lime-water, during the day. He now complains of increased soreness in the gums, and an irregular voracious appetite, attended by frequent vomitings of food in an undigested state. Pulse 102. feeble and irregular. Finding there was little, or no chance of restraining him from the occasional use of vegetable food, and despairing of his recovery, he was permitted to combine bread and vegetables with his animal diet.

July 1*st*—19*th*.

The patient has been evidently sinking, although the quantity of urine, voided each day, does not exceed the former statement. The average being twenty two pints every twenty-four hours. The swelling of the lower extremities has much increased, and he is troubled with a teazing dry cough: the hopelessness of his situation was strongly depicted in his countenance, and his dissolution seemed evidently approaching.

Notwithstanding his extreme debility, on the 18th, and 19th, he was able to walk about the ward, and expressed himself even with cheerfulness; but on the 19th, at 2 o'clock p. m. he was suddenly attacked with a pain in the stomach, succeeded by violent convulsions, which shortly put a period to his existence.

REMARKS.

REMARKS.

This, at first view, seemed to be a hopeless case. The disease had been so rapid in its progress, and had made such ravages in the patient's constitution, that little could be expected from any plan of cure. The quantity of urine (thirty-six pints) discharged in twenty-four hours, is equal to, if it does not exceed that of any other instance which has been recorded by authors of credit. The proportion of residuum (nearly two ounces to one pint) is also very extraordinary, especially when we take into the account that it only formed a twenty-eighth part of the solid matter, drained off from the body in twenty-four hours.

This immense and rapid waste was, however, nearly supplied by the patient's greedy appetite, for both solid and liquid nourishment. It is worthy of remark, that on some days, the register pointed out an excess in the liquid *egesta* considerably beyond that of the whole amount, both of the solid and liquid *ingesta;* now as this superiority of the *egesta* to the *ingesta* has been often insisted upon by some practitioners, and denied by others. I felt very anxions to ascertain the fact in the present instance: and, therefore, when the register denoted that such a circumstance had happened,

I was

I was very cautious and diligent in my enquiries concerning the accuracy of the report; and in no instance was I able to detect any irregularity or imposition on the part of the patient or attendants.

In this case, as in the foregoing ones, much advantage was derived from the use of the *nitric* acid. It greatly assuaged the thirst, and was grateful to the palate, but its effects on the bowels often prevented a further trial. Opium, with rhubarb, was generally serviceable in allaying irritation, and probably the diminishing the morbidly increased action of the stomach. Perhaps success could not reasonably have been expected in the treatment of this deplorable instance of diabetes mellitus; and I must confess, that at first, my most sanguine hopes did not extend beyond a palliation of the more urgent symptoms; but from the unexpected, rapid, and important improvement, which the patient experienced soon after his admission, I am inclined to believe, that had he steadily persisted in the plan of cure, and no accident to his leg had occurred, his life might have been considerably prolonged; and perhaps the diabetic symptoms eventually subdued.

Case V.

Thomas Whitehead, Æt. 50.

Admitted an In-Patient, April 22d, 1805.

Complains of a preternatural flow of sweet tasted urine, (which on some occasions has amounted to twelve pints in twenty-four hours) of thirst, and dryness in the mouth, and great pains extending over the loins and pubes. The appetite is irregular and sometimes craving. He has served nine years as a soldier in the East Indies, where he was much exposed to all the hardships incidental to the climate. Since his discharge from the army, he has acted for some years as a watchman in Manchester, and during this employment, he indulged freely in the use of spirits, and often suffered from cold, wet, and fatigue.

About four months since, he was first attacked with the pain in his loins, unusual thirst, heat, and a slight increase in the quantity of urine. The pains were not stationary, but would suddenly leave him for the space of a week, and then return upon the least fatigue, or increased exertion, with an augmentation in the quantity of his urine.

He was never fond of vegetables, and since his illness has confined himself to a milk diet: pulse 86.

23d.

23d.

He was ordered to live on cold beef and mutton, and occasionally fat pork. For common beverage, one drachm and a half of nitric acid, to three pints of water; two blisters were applied to the region of the kidneys, and an opiate with rhubarb, at bed time.

24th.

Drink three pints, solid *ingesta* one pound. Urine four pints: one pint of the urine when evaporated, left a residuum weighing four drachms and five grains, which exhibited an urinary smell and taste, but its consistence was tenacious, and unlike that obtained from healthy urine. Has passed a more comfortable night; his thirst, and inclination to make water being much abated.

25th.

Solids	*Liquids*	*Urine*
14oz.	2 pints	$3\frac{1}{2}$pints

His bowels are open, and thirst moderate. He complains of great faintness in the morning; pain in the loins and pubes relieved; his urine is still sweet to the taste.

26th.

Solids	*Liquids*	*Urine*
9oz.	3 pints	3 pints

27th.

27th.

Solids	*Liquids*	*Urine*
1lb	3 pints	3 pints

Says his acid mixture rather gripes him, but is ordered to continue its use.

28th.

Solids	*Liquids*	*Urine*
15oz.	3 pints.	Less than 3 pints

Thirst almost gone.

29th.

Solids	*Liquids*	*Urine*
1lb	3 pints	$2\frac{1}{2}$ pints

The urine now appears of a natural colour, and possesses nearly its usual smell and taste. The patient feels much disinclination to his animal food, and complains of loss of appetite and general debility. He was allowed two ounces of toasted oat-cake daily.

30th.

Solids	*Liquids*	*Urine*
19oz.	3 pints	$3\frac{1}{2}$ pints

(Bread two ounces, animal food seventeen) The urine has acquired a sweet taste, and the patient's thirst has rather increased; but he feels stronger, and looks more cheerful.

May 1st.—June 10th.

During this interval, a very favorable altera-

tion has taken place; the allowance of bread has been gradually increased to six ounces daily, without any unfavourable change in the qualities of the urine, which on the 3d, amounted only to two pints, while the drink was nearly three pints, and the solids one pound. The colour of the urine is quite natural, and it has lost nearly all its saccharine taste and smell.

On evaporation, one pint yielded four drachms, and twelve grains, of a dry, friable, and urinous residuum; differing little in bulk or appearance, from that which is commonly the product of the same quantity of healthy urine.

The liquid *egesta* has been, on the average, considerably inferior in quantity, to the *ingesta*. On some days, the former exceeded the latter, more than one third.

The patient's stomach was not able to digest some brocoli, that was allowed for dinner: it occasioned acidity and griping, and was therefore discontinued.

10*th*.—18*th*.

On the 13*th*, his bread was increased to seven ounces, and a pint of milk allowed for supper; in consequence of which alteration, he passed

a restless night; and his urine exceeded more than one-third the liquids he had drank for the last twenty-four hours. On the 13th, he complained of slight febrile symptoms, with nausea, and a sour taste in the mouth.

He was ordered an emetic, and a gentle purgative; on the 18th, the febrile symptoms had totally vanished, and believing himself to be nearly cured, he was urgent to be made an out-patient; at the same time, promising a faithful adherence to the plan of diet, and mode of keeping the register; which he had so strictly followed, while in the Infirmary. He was discharged accordingly.

24th.

The patient was re-admitted into the house, as he experienced a return of his complaint. His urine had augmented in quantity, and become sweet to the taste; his pains in the loins and pubes were troublesome; and his flesh and strength both diminished. His circumstances had not permitted him to adhere steadily to his late plan of diet, and he had also returned to his occupation in a cotton-mill.

To these causes, the relapse of his disorder may be attributed. He was again put upon

animal diet, without milk or vegetables; and the acid mixture, and beef tea. were ordered for common drink; an opiate at night, and the blisters on the loins, were also renewed.

July 3d.

By persisting in this plan, the diabetic symptoms have been again subdued. The solid *ingesta* amounted to eighteen ounces, and the liquid to four pints; urine to three pints and a half, which had lost all its sweetness, and was of a natural appearance; still the patient remained feeble, and did not gain flesh; he was therefore ordered the bark with alum, and occasionally, when griped, a carminative mixture with opium; and likewise toasted bread to be added to his diet.

6th.

The patient has taken four ounces of toasted bread each day; not only with impunity, but evident advantage to his appetite and strength.

The liquid *ingesta* and *egesta*, have been nearly balanced, and never exceeded three pints each in twenty-four hours.

In order to confirm the cure, and restore the patient to general health, he was continued under a similar treatment, with the addition of a more liberal use of vegetable food, and a small

small portion of wine, until the 20th; when he was discharged, not only free from every diabetic symptom, but quite restored to his wonted health and vigor.

Remarks.

This case is important, not only on account of its successful termination, but also from the entire dependance to be placed on the facts, as stated in the reports of the register. It is an evil which has often been lamented, that the negligence of nurses, and the gross ignorance, and irregular habits of the generality of patients, belonging to public Hospitals; render it difficult, if not almost impossible, for the practitioner to be assured, that his orders are implicitly obeyed, whenever they enjoin great restraints and privations on the part of the sick.

But in the present instance, no suspicion could be attached to the patient, for his conduct was uniformly regular, and he sustained, with credit, the most minute and scrupulous inspection. Finding him to be a very intelligent man, capable of keeping a Journal, and duly impressed with the necessity of a strict adherence to his plan of written instructions, I was induced to furnish him with accurate weights

weights and scales, and proper vessels, that he might keep an exact register of both the liquid and solid *ingesta*, and the liquid *egesta*. This was strictly complied with, and the register was submitted to my daily inspection, and to the more frequent superintendance of Mr. Heartley, House-Apothecary, and Mr. Le Sassier, Physician's Pupil. Most, if not all of the characteristic symptoms of diabetes mellitus, were to be discovered in this case. The sweetness of the urine was first noticed by the patient, who was led to taste it from its peculiar odour. The emaciation was certainly much greater than might have been expected, from the short duration of the complaint, and the comparatively moderate discharge of urine. Yet the increased bulk of the urinary residuum, and its altered consistence, sufficiently prove, that much animal extractive matter was carried off by the kidneys; but it does not appear, from its sensible qualities, that the extract contained any portion of saccharine matter, although it is very probable, that the predominant flavor of the urinous salts might prevent its detection.

In other instances (one of which will be noticed hereafter) where the urine was sweet to the taste, and yet the residuum devoid of that

that quality; oxalic acid was obtained, by treating the latter in the usual way with nitric acid.

The efficacy of animal food, in subduing the diabetic symptoms in this case, is placed beyond all controversy. Its effects were rapid, manifest, and decisive. For, when the patient could not confine himself to this part of the plan, although he steadily persisted in all the rest, a relapse speedily ensued.

He likewise found great and evident relief from the application of perpetual blisters to the loins; and the nitric acid proved useful in abating thirst and heat.

It is worthy of observation, that in this case, as well as in some of the others, there seemed to be a certain period, at which it was necessary to join vegetable with animal food. For when the more urgent and characteristic symptoms were subdued, but at the same time the strength and bulk rather diminished than increased, and the appetite also feeble and fastidious; it was then found necessary to administer with caution, a small proportion of vegetable food. The salutary effects of this addition were soon visible in the patient's improved appetite, and increase of flesh, strength, and spirits. Moreover, whenever a return

return to vegetable diet was suffered, not only with impunity but advantage; it formed the surest criterion of the restoration of the assimilating powers of the system, and consequently of the removal of the disease.

I have the satisfaction to add, that I have since frequently conversed with this patient, and found him free from any return of his complaint; and that he is now (September 9th, 1806.) in the enjoyment of better health than he has experienced for many years past.

Case VI.

George Barratt, Æt. 43. *Husbandman, In-Patient, December 23d,* 1805.

Was admitted as a case of Diabetes Mellitus, under the care of my late worthy colleague, Dr. Jackson, only a few days after William O'Brien (whose case follows) entered under mine. As Dr. Jackson was acquainted with the circumstance of my having enjoyed frequent opportunities of treating this disease, he consulted me on the plan to be pursued. We accordingly determined that this patient should live upon the ordinary diet of the house, without any particular restraint from vegetable food; and that his medical treatment

treatment should be confined to the exhibition of the nitric acid, to the amount of about two drachms in twenty-four hours. This quantity to be increased or diminished, according to its effects on the system. On examining the patient, I collected the following particulars:

He has been many years married, and for the most part enjoyed good health, but was liable to profuse sweating upon any ordinary exertion; and at such times, was accustomed to quench his thirst by drinking immoderately of cold whey, sour butter-milk, &c.

His diabetic symptoms commenced two years ago; and he remarked, that since the great thirst, and flow of urine came on, his propensity to sweating had been diminished. He discovered, twelve months since, his urine to be sweet; from being persuaded, by a neighbour, to drink it, as a cure for his disorder.

The quantity of his water he estimates to be nearly twenty quarts every twenty-four hours, but he never exactly measured it. His appetite is extremely ravenous, and may be said to be omnivorous. He was accustomed to devour raw vegetables, when boiled ones were not in the way; and he believes that he has consumed, in one day, five or six pounds of animal food.

He

He gets little sleep from the interruption every half hour, during the night, to make water; and he conjectures that the quantity far exceeds the amount of his drink. For six months past he has never experienced any venereal desires, and the semen is involuntarily discharged, but there is no phymosis: pulse 86. The emaciation is very great, and the debility proportionable. He is above the middle size, and was formerly a stout and muscular man; but he is now so much reduced, that he only weighed nine stone, twelve pounds; three days previous to his leaving home. He was capable, and very desirous, of keeping a register of the *ingesta* and *egesta;* and the better to secure the faithful discharge of this task, he was put into the same ward with my patient, O'Bryen, (in whom I deservedly placed the greatest confidence) who was instructed to watch privately over his conduct. I shall select from this register, (which I have every reason to believe correct) and my own notes, such particulars as are most deserving of notice.

On the 25th of December, the urine he passed within the last twenty-four hours, measured thirty-two pints, and his drink of nitric acid, diluted with water, twenty-five pints; exclusive of three pints of beer porridge mixed.

mixed. The urine was whey-coloured, and sweet tasted; and in thirty-six hours after the addition of yeast, fermented briskly. It yielded by evaporation, from one pint, twelve drachms of a thick, sweet syrup. His diet chiefly consisted of puddings, bread and milk and beer porridge; with animal food four times a week. The acid agreed well with his bowels, abated his thirst, and relieved his burning heat. He rested better in the night, and made less water.

On the 6th of January, 1806, the liquid *ingesta* had decreased to seventeen pints and a half, but the urine had lost none of its diabetic properties; the patient's strength was not increased, and his appetite was nearly as importunate as ever.

Upon consultation with Dr. Jackson, it was determined to abridge the patient of all vegetable food; and to continue his acid drink: an active emetic was to be first administered, and afterwards a brisk purgative, as a necessary preparation to his entrance upon the plan of animal diet.

The patient was transferred to my care by Dr. Jackson; and the quantity of solid *ingesta*, as well as the liquid, was now ordered to be noted in the register.

January

January 6th—16th.

The patient threw up a large quantity of acid contents from his stomach, in consequence of the emetic.

Since the alteration in his diet an important and decisive improvement has taken place. His thirst is much abated. His mouth and tongue are moister and cleaner, and he sleeps longer and sounder. His strength is remarkably increased, and he feels every way more comfortable and alert.

His craving for food is entirely gone: and the sense of internal heat, especially in the palms of the hands, and soles of the feet, greatly moderated. His finger ends, which before felt benumbed, and looked almost livid, are now of a natural warmth and appearance; and the skin, which was before hardened into scales, is become quite renewed, and feels soft and moist.

On the 9th, the solid *ingesta* were one pound and ten ounces, liquids eleven pints and a half, urine fourteen pints; and upon the average the *egesta* have exceeded the *ingesta*.

The urine is neither so sweet nor so whey colored and turbid, it has indeed a bitterish taste which resembles new small beer: one pint of

of this fluid yielded only nine drachms and a half of a dark coloured extract, which yet differed but little in its sensible and chemical properties from the last.

January 16*th*—*February* 1*st*.

There has been a considerable fluctuation in the quantity of the urine discharged within this period.

On the 19th, the solids were nineteen ounces, liquids twelve pints, and the urine sixteen pints; while on the 23d. the solids amounted to one pound and twelve ounces, and the liquids to only *six pints and a half*, and the *urine seven pints* and *a half*.

It is, however, proper to notice, that on this day he had been troubled with a griping and purging, though not in a very considerable degree.

The urine is very slightly sweet, and has a more natural appearance; indeed the general change for the better, is strongly marked in the patient's person and countenance.

February 1*st*—*March* 1*st*.

There has been, upon the whole, a considerable amendment in the patient's disorder, within this period. He was allowed four ounces of toasted bread daily, and eggs and beef tea, occasionally.

This

This addition of vegetable food did not increase either the quantity, or saccharine quality of the urine; but on the contrary, its quantity has been decreased, his appetite improved, and his strength recruited.

It appears, on the 13th, (four days after the use of bread) that he ate with great relish, four ounces of this article, along with two pounds, three ounces of animal food; while his drink measured only five pints and a half, and the urine seven pints.

Whereas for seven days previously to the admixture of vegetable with the animal diet, the average daily quantity of his animal food did not exceed one pound six ounces; yet the urine, during the same period averaged about nine pints, and the drink seven pints and a half.

The urinary residuum on the 9th, weighed ten drachms, and was of the same colour and consistence as the last; but its smell and taste were partly saccharine, and partly urinous. Indeed the urine, when tasted, seemed to partake of the same mixed properties.

In addition to these favorable changes, some other important ones were very conspicuous.

The patient had gained flesh, was more alert in his motions, and his countenance had become

come cheerful and animated. I saw him weighed on the 19th, and had the pleasure to find that he had gained not less than *seventeen pounds and a half,* since his entrance into the Infirmary.

The venereal appetite had returned, and the involuntary flow of the semen had entirely disappeared.

March 1*st*—*April* 1*st*

Nothing remarkable has occurred within this period. The highest quantity of urine has reached to nine pints, and the lowest has fallen to five pints; but the average may be estimated at six pints, each twenty-four hours. There is still a slight excess of this discharge, when compared with the drink. One pint of urine left upon evaporation nearly eleven drachms of a thick extract, which differed a little in its sensible properties from the last, as it was rather bitter, than either salt or sweet to the taste.

The patient is so far improved in general health and strength, as to be able to carry all the coals into the different wards upon the same floor, and to assist in various employments about the infirmary. He never feels thirsty but at meals. His appetite is regular

and

and moderate, and he can sleep eight or nine hours without any interruption..

He was desirous of being discharged, as he fancied himself quite cured, and capable of undertaking his usual employments. As the urine, however, was not entirely free from saccharine impregnation, and consequently the assimilating powers of the system not completely restored; it was thought advisable, both on the patient's account and for the sake of making a fair trial of the efficacy of the method of the cure, to detain him in the house for some time longer.

April 1st—20th.

He has remained nearly stationary during this interval. The average quantity of urine does not exceed six pints, it has no perceptible sweetness, but has very little of a urinous flavor. One pint of it on the 6th afforded ten drachms of a thick dark coloured extract, which certainly was both salt and sweet to the taste. The patient was weighed on the 15th, and was found to have gained four pounds since February the 29th. He observes that his old habit of sweating upon slight exertions has returned; but he does not find himself weaker on this account.

Indeed, with the exception of the peculiarity of

of his urine, he may be said to enjoy his ordinary state of health; and he is now so importunate to return to his family and usual occupations, that upon his promise to adhere as closely to his plan of diet as circumstances would permit, he was discharged on the 20th instant.

Remarks.

It appears from this well marked instance of diabetes mellitus, that the nitric acid is productive of considerable advantage, in mitigating the thirst and heat, and thereby lessening the quantity of urine; but it is proved to be incompetent to destroy the saccharine impregnation of this fluid, or to arrest the other characteristic symptoms of the disease.

The efficacy of animal diet is strongly exemplified by the reduction of the quantity of urine from twenty pints to nine pints, in twenty four hours; and by the nearer approach to equality between this fluid and the liquids drank; but especially by the disappearance of great part of the saccharine properties of the urine; all which events speedily followed the use of this regimen. Perhaps there could not have occurred a more favorable opportunity to ascertain the real effects of abstinence from

vegetable diet than what the present case affords. For the disease had existed two years; its symptoms were unequivocal, and had attained their height of virulence; and the patient's constitution seemed free from any other malady. Nor were the opportunities for a trial of the remedy less auspicious. The patient was docile, steady, and capable of attending to the directions which were given him; and he was under the vigilant care of the House Apothecary, and also of an intelligent and well principled patient, who was similarly afflicted; and the whole arrangement was submitted to my daily inspection and superintendance.

If then the evidence contained in the reports on this case be admitted as correct and satisfactory, it will place beyond all doubt the existence of a fact which has lately been much disputed. viz: That in Idiopathic Diabetes Mellitus, the quantity of liquid *egesta* does sometimes exceed that of *both* the *solid and liquid ingesta*, and that the excess of the former cannot be accounted for solely on the supposition of its being derived from a general wasting and dimunition of the solid and fluid parts of the system. For in Barratt's case we find, that during the period in which the register clearly pointed out almost a regular daily

daily excess in the amount of the urine, compared with that of the liquids and solids taken; the patient, notwithstanding, had gained an accession to his weight of seventeen pounds.

This singular phœnomenon was likewise noticed, though not in so striking a degree, in the reports of the two last cases. Both Wild and Whitehead gained strength, and apparently flesh; while at the same time the balance between the liquid and solid *ingesta* and *egesta*, was rather in favor of the latter.

To what law or process of the animal economy is the supply of this superabundant quantity of urine to be attributed? Is it derived from cuticular or pulmonary absorption; or from a colliquation of the humours of the body? Each of these modes of supply have been insisted upon, by different writers.

I shall not, however, enter into the controversy, but content myself with remarking, that what happened in Barratt's case, seems to set aside the latter hypothesis; for (as before observed) he gained weight, during the time that the urinary discharge exceeded the quantity of his drink; but it is proper to remark, that during his acquisition of strength and flesh, the sweetness of the urine, as well as other of the characteristic Diabetic symptoms were on

the decline. This alteration of the qualities of the urine denoted the restoration of the assimilating powers, whereby the saccharine portion of the chyle was duly applied to the purposes of nutrition. Hence arose, I should imagine, the increase of the patient's vigor and bulk; notwithstanding the superiority of the quantity of urine to the liquids taken, remained. When the patient entered upon a mixture of vegetable with animal food, his strength and bulk were still more evidently increased, although the disproportion of the urine to the drink, remained stationary.

But as he was enabled by this plan to get down more solid food, and the powers of the system were capable of converting the same into nutriment, it is not surprising that his strength and flesh were so manifestly recruited.

The quantity of extractive matter in this patient's urine did not diminish in the degree that might have been expected; considering the amendment, not only of the specific complaint, but also in his general health. Nor could it be said, that the saccharine impregnation of the urine, was ever completely subdued, although the disease was brought into that mild state, which led me to hope that it might be ultimately cured.

The

That the existence of sugar in the urinary residuum, obtained only a few days previous to the patient's departure, was proved by submitting it to the proper tests; but these chemical experiments will be adverted to, when the result of others of a similar kind are noticed.

There is one fact which I have omitted to mention, but as it serves, in some measure, to point out the Diabetic state of the urine, and was found to exist in this, as well as the other confirmed cases of Diabetes Mellitus, it may be proper to notice it. The urine not only stained the linen, but thickened it as if starch, or mucilage, had been applied. In proportion as the urine discovered less of saccharine and extractive matter, and the disease declined, it lost the properties both of stiffening and staining the linen. Barratt himself remarked with pleasure this change, which took place not long after he had entered upon animal diet.

Since writing the above, I received a letter from the patient's widow, in answer to some enquiries, informing me, that her husband died on the 12th of May, about three weeks from the date of his discharge. I then wrote to Mr. Wilson, Surgeon of Altrincham, who attended Barratt the day before his death, and he very obligingly communicated the following par-

particulars; and at the same time transmitted a register which the patient had very diligently attended to, and preserved.

His diet had consisted of coffee, tea, and occasionally both, to breakfast; toasted oat-cake and milk, to dinner and supper; he made use of some opening pills when necessary; and lime water, to the amount of a pint daily.

He was capable of following his usual employments, and his thirst was not more than natural to a person in health. From the register it appears, the average amount of his urine was nearly five pints and a half each twenty-four hours; but it still exceeded the quantity of his drink. Its taste and colour remained nearly natural. His appetite and strength had not improved since he came home, and his bowels had been remarkably constipated.

On May 5th, at a public house, he ate very plentifully of bread and cheese, and drank two pints of porter. After this refreshment, he was seized on his return home, with an uneasy sensation in his bowels, which terminated in a violent fit of the colic. He continued in this state, without any medical assistance, till the 11th, when Mr. Wilson first saw him. He found the patient evidently sinking under *Enteritis*. The bowels had never been emptied since

since his first seizure, and now resisted all attempts to procure an evacuation. On the same evening, the pain suddenly abating, the patient became faint, and soon after expired.

From the above narrative, it is highly probable, that the patient died of an inflammation of the intestines, which was brought on by over repletion, and suffered to terminate fatally, from the want of early medical assistance.

Case VII.

William O'Brien, Æt. 33. *Weaver, Admitted an In-Patient, December* 17, 1805.

Began nine months since, after an attack of *Hæmoptysis*, to be affected with extreme thirst, and burning heat, in his hands and feet. These symptoms were soon followed by an increased flow of sweet-tasted urine. He first noticed the quantity of urine to exceed the liquids taken, about three months ago. He has frequently passed eighteen pints of urine during the night, and only drank seven pints within the same period; but on such occasions, his increased thirst, towards the evening, had compelled him to drink copiously before he retired to rest. The average quantity in twenty-four hours, has exceeded twenty-six pints

pints of urine. He has never been a free liver, nor fond of ardent spirits; is a married man, and regular in his habits. The urine has been reduced within the last month, to thirteen pints in twenty-four hours, but is still often passed involuntarily. He has a tickling cough, and slight pain in the side; his ancles are puffed, and his strength, flesh, and spirits, greatly exhausted. He has lost, for several months, all venereal power, and inclination; and the semen is often involuntarily discharged.

Pulse 112, soft and regular, his appetite is often voracious, and the contents of the stomach are sometimes discharged in a state of great acidity. There is no phymosis, I found his weight to be 133 pounds: he has lost 42 pounds since his first seizure. His height, five feet ten inches. On examining his urine, it exhibited the characteristic properties of Diabetes. The solid and fluid *ingesta*, were ordered to be weighed and measured, and the liquid *egesta* accurately registered*.

* From the similarity of this case to that of Barratt's, and some others, I do not think it necessary to enter so fully into detail as usual. I shall therefore confine my report, to a general outline of the case, and a notice of some particulars, both in its history, and mode of treatment, in which it varied from those already described.

The

The patient was ordered to abstain from vegetables of every kind, and to live upon animal food, and broth; his common drink to be lime-water, with a fifth part milk. Two spoonfuls of brandy to a quart of water were allowed during the night, as the sickness, and extreme debility of the patient seemed to demand a degree of cordial support. A brisk emetic in the evening; pills with opium and rhubarb at bed-time; blisters to the region of the kidneys, and hepatised ammonia, were likewise prescribed. He was directed to use the warm bath at 104 degrees of Fahrenheit; and, in order to ascertain the reality of a supposed increased activity of the absorbent vessels in this disease, I saw him weighed naked, both before and after bathing, on three different occasions. The pulse was also counted, and the heat of the body ascertained.

17th. Nine o'Clock, P. M.

Pulse before bathing, 100. after bathing, 109
Heat of the Body, - 97 - - - - 99
Weight of the Body, 127½lb - - - 127¼

He remained in the bath fifteen minutes. The emetic caused him to throw up a large quantity of acid contents from the stomach; and

and, at the close of the operation, a ropy, glairy substance was discharged. One pint of urine was evaporated, the residuum of which, resembled treacle, in taste and appearance, and weighed thirteen drachms. A speedy and favorable change immediately followed this plan of treatment, and continued for a few days, when the patient was attacked with a violent griping, and diarrhæa. This evacuation proved to be in some measure, a vicarious discharge; for it diminished the quantity of urine to five pints, in twenty-four hours. This was the fourth or fifth similar attack, which was always attended with a remarkable decrease in the quantity of urine. But there was this essential difference, between the present and former instances.—In the former, the sensible qualities of the urine remained unchanged; (the patient was led to ascertain this point, from a hope, that his disorder would be cured by the purging) in the present instance, the urine had lost great part of its Diabetic properties. This conversion of the disease was, however, attended with serious injury to the patient's general health. His appetite and strength totally failed, and it was with great difficulty the bowels were restored to their regular state; a variety of astringent

tringent medicines, with opiates, and the warm bath, were tried in vain: small doses of antimonial wine, with tincture of opium, and starch glysters at bed time, together with gum acoroides, and extract of logwood in the day, at last succeeded. The diarrhœa continued nearly three weeks. After this troublesome symptom had been removed, the patient daily recruited. On the 7th of January, when the diarrhœa was very urgent, he weighed in his ordinary dress, 134 pounds, 13 ounces; on the 23rd, when the complaint had ceased, and all the diabetic symptoms were much diminished, he weighed in the same dress, 144 pounds, nine ounces; shewing an increase in bulk, since his admission, of ten pounds. The sensation of burning heat in the palms of his hands, and soles of his feet, sour taste, and clamminess in his mouth, and dryness and harshness of the skin, have all disappeared. The urine is rather bitter than sweet, but has not yet lost its Diabetic odour and colour. Since the purging ceased, the average amount of this fluid has been increased from five and six, to eight and nine pints, each twenty-four hours. The liquid *egesta* and *ingesta* very nearly balanced each other. On the 20th, the patient was indulged with

with boiled milk to supper, and the following morning, his urine pointed out the impropriety of this change of diet, by an increase of its Diabetic properties. The pulse is now reduced to 84, and the patient is free from the sense of weight, numbness, and occasional pain, which he before experienced in all his joints. The same plan of medicine and regimen was continued, except that the nitric acid, diluted with water, now composed part of his common drink. In a few days it was necessary to omit the acid, as his bowels suffered from its use. Soda water was therefore substituted, which quenched the thirst, agreed well with the bowels, and was highly gratifying to his taste. He has been twice weighed since the 23rd, and was found to have lost from three to four pounds.

On repeating the experiment of the warm bath, it was attended with the same result. No weight was gained, although the patient continued half an hour in the water each time. A tepid bath was found useful in keeping the skin moist, and abating stiffness, and weariness of the joints. It was therefore frequently repeated. As he now began to feel an aversion to animal diet, and his diarrhœa being troublesome, he was allowed flour, which

which had been boiled till it was perfectly dry and hard, mixed with milk at supper. The looseness was thus checked; but his Diabetic symptoms were increased; and spontaneous sweats were not uncommon in the night, and seemed to alternate with the diarrhæa. The milk and flour were therefore laid aside, and six ounces of toasted oat-cake substituted, at breakfast and supper; eggs, and beef-tea, also formed a part of his diet. By this plan, the diarrhæa was moderated, and the appetite improved; but yet the patient rather lost than gained strength, and his urine amounted daily to eight pints, and equalled his drink. The residuum of one pint of urine, which was evaporated on the 7th of January, weighed nine drachms and a half; and the same quantity of urine yielded, on the 27th, twelve drachms; both discovered Diabetic properties; but considerably less than on the first experiment. The patient's complaint remaining nearly stationary, under this treatment, until the middle of February; I was induced to try the effects of *bark*, in *large doses*, in consequence of the recommendation of my friend, Dr. Robinson, of Preston, who mentioned his having seen it exhibited with success, under similar circumstances. The patient

patient was ordered to get down as much bark as the stomach would bear, in brandy and water. He took from one ounce, to one ounce and a half, each twenty-four hours, and persisted in this plan for more than a week, without any sensible advantage. Neither the quantity nor the quality of the urine was in the least altered, but a cough, and pain in his side became troublesome, in such a degree, as to forbid the further use of this remedy. When these latter symptoms had completely subsided, I found my patient, March 18th, in precisely the same state he had been six weeks before. The urine nearly of a natural colour, and rather salt to the taste; but when evaporated, its residuum discovered a saccharine impregnation. The quantity equalled that of the liquids taken in, and the average amounted to seven pints in twenty-four hours. The same regimen was ordered to be continued, but the following tonic, and astringent composition; which I was informed had succeeded in Diabetes, with the practitioner, who recommended it to me for a trial; was substituted for every other medicine.

℞: Coricis

℞ Corticis Querci,
——— Granat.
Fol. Rosæ rubr:
Pulv. Gallar: sing, ʒij.
Aq. Fabri ferrarii ℔iſs.
Coque ad ʒxij. coletur, & in liquore colato solve,
Alum. rup. ʒſs.
Tinct. Styptic. ʒiſs. M. Sumt. ʒij bis terve in die.

He persisted in the use of this medicine for several days, without the least impression being made on the disease; but with much inconvenience to his stomach and bowels. It was therefore discontinued. Wine was now allowed, and puddings with suet, and a little flour, which diet did not increase the saccharine properties of the urine. This discharge was diminished by the fourth of April, to five pints in twenty-four hours, and did not quite equal the quantity of liquids taken. The urine had lost all its Diabetic properties to the taste and smell, but its residuum discovered a saccharine impregnation, although comparatively slight. The patient has rather lost flesh since he was last weighed. He is subject to a tickling cough in the morning, and wandering pains in the chest, with slight hectic flushes in the evening. On this account, milk was added to his former diet, and

it

it was thought proper to make him an *out*-patient. He was accordingly discharged, *much relieved,* on the 4th of April, but was strongly enjoined to a perseverance in his regimen and diet. He rather improved for some time after his arrival at Stockport; but in a few weeks his cough increased in violence, and brought on a return of the *Hæmoptysis.* The hæmorrhage from the lungs was very profuse, and soon reduced him to a deplorable state of weakness. I saw him this day, September 28th, and found him sinking under *Phthisis Pulmonalis,* but almost free from every Diabetic symptom.

Remarks.

It would appear from this, as well as many other cases upon record, that Diabetes Mellitus often terminates, when fatal, in *Phthisis Pulmonalis.* I scarcely recollect an instance of the disease, where a slight affection of the breast did not more or less prevail. In this patient the pulmonic symptoms, which preceded the attack of Diabetes, seem to have been suspended by the influence of this latter disorder; but, that after the Diabetic symptoms had partly disappeared, the diseased action of the lungs was renewed, and the con-

version

version of Diabetes into Phthisis became complete, and hastened the patient's dissolution. In this case, the liquid *egesta* exceeded the amount of both solid and liquid *ingesta*. I have no doubt of the accuracy of this statement. The excess was some days so considerable, as to excite astonishment; and yet the patient lost no weight. The experiment of the warm-bath was thrice repeated, without any addition to the patient's weight by absorption. Dr. Currie has drawn conclusions from this fact, which are adverse to the hypothesis of the supply, by the absorption of the skin being equivalent to the discharge by the kidneys. Indeed he has positively inferred from similar experiments, that no absorption takes place when the body is immersed in the warm-bath. But Dr. Sheriff, in his ingenious Thesis on Diabetes, published at Edinburgh in 1804, has properly suggested some doubts as to the correctness of the inferences which have been drawn from Dr. Currie's experiments; and I cannot avoid joining him in opinion, that a fallacy has crept into Dr. Currie's conclusions, from want of a due consideration of all the phænomena connected with the experiment. For while Dr. Currie asserts, that neither an increase nor a

diminution of weight took place during the immersion of the body in the warm water for one hour, he at the same time remarks, that the patient was losing twenty ounces in weight each twenty-four hours. Now if no absorption had happened, the body must according to this calculation, have lost five-sixths of an ounce during the hour of the patient's immersion: but, as no difference in weight was perceptible, it clearly follows, that the absorption was sufficient to supply the ordinary loss of these five-sixth parts of an ounce. Besides, when we consider that there is a constant exhalation, both from the surface of the body, and the lungs, and that during the application of heat, the action of the exhalent vessels is manifestly increased; we must suppose in like manner, that the absorbents are roused into greater energy; and thus the loss of fluid by the former, is counterbalanced by the gain of the latter. For if the absorbents were not equally stimulated, a deficiency of weight must of course be manifested after the operation of bathing. But all the experiments prove directly the contrary. There is another fact that serves to confirm the hypothesis of an increased absorption by the skin in Diabetes. It is mentioned by several writers,

par-

particularly by Dr. Sheriff, that an inunction of the body with oily substances is attended with a diminution both of thirst, and of the urinary discharge. This was remarkably exemplified in the case of Symmington, which Dr. Sheriff has transcribed from the clinical reports of the Royal Infirmary, at Edinburgh.

Case VIII.

Abraham Beswick, Æt. 52. *Weaver.*

July 28, 1806.

Was admitted an In-patient, by Dr. Dewar, one of the Physicians to the Infirmary, as a case of Diabetes Mellitus. I saw him along with Dr. Dewar, soon after his admission; and learned the following particulars. He had been much addicted to dram-drinking, until he was thirty years of age; his constitution was naturally robust, but the slightest bodily exertion threw him into profuse sweats; on these occasions he was in the habit of drinking to excess, either of buttermilk, or treacle-beer. Just before his seizure, he had suffered greatly from excessive, and almost uninterrupted hard labour for several weeks, in order to defray the expences of his wife's funeral; and to provide for a

young and numerous offspring. He gratified his thirst, and sustained his exertions at this period, chiefly by butter-milk, and sour oat-cake. It was not long before he remarked his appetite to become exceedingly craving, attended with acid eructations, and occasional vomitings. Permanent heat of the skin, and immoderate thirst, soon succeeded, attended with pains, and weariness in the muscles, and a total cessation from sweating, after exercise. Two months had elapsed before he noticed that his urine was sweet-tasted, and increased in quantity. He discharged thirty-one pints, by measure, in twenty-four hours, about a month ago. His weight, when thirty-four years of age, and in health, amounted to twelve stone, thirteen pounds; but the week before his admission, it did not quite reach to eleven stone, seven pounds.

Upon examination, I found him to labour under a slight phymosis. His skin is harsh and scaly, and his finger-ends livid, cold, and apparently without much sense of feeling; pulse 108. He discharged eighteen wine pints of uncommonly sweet tasted urine, in the last twenty-four hours, and his calls to make water are most frequent in the night. He has for some time past, felt no venereal incite-

ment

ment, and the semen passes off after any strained effort to void his urine.

His gums are sore, and teeth loose. Height five feet five inches; his frame strong built, and fleshy. One pint of his urine was exposed to evaporation, and produced one ounce, and three drachms (or 660 grains) of a thick extract, resembling treacle in its sensible qualities. He was first ordered an active emetic, to live entirely upon animal food, and to use the diluted nitric acid for common drink. Eggs for supper, aud beef-tea occasionally. The warm bath, and an opiate at bed time, and a blister to cover the region of each kidney, were likewise prescribed. The quantities of urine, and drink, were also to be registered. But either from misapprehension, or negligence of the patient, he had deviated from a strict adherence to animal diet, in taking milk, and sometimes a little bread.

Dr. Dewar, being apprized of my former attention to the subject of Diabetes, obligingly transferred his patient, on the 16th of September, to my care. He was immediately provided with the necessary apparatus to weigh and measure, both solid and liquid food; and also his urine, with convenience and

and accuracy; and he was likewise furnished with the plan, and means of keeping a register; which was regularly inspected, and attended to by myself. I find him much improved since my first visit. His urine is reduced to nine pints within twenty-four hours, and it does not exceed the liquids taken. His skin is soft, and occasionally moist, and the scales have almost disappeared. He is stronger, and looks more chearful. Still his urine has rather a fragrant odour, and sweetish taste, and his mouth is clammy, with an acid fætor in the breath. The residuum of a pint of his urine, on the 13th of August, weighed one ounce and one drachm (or 540 grains.) And on the 22d, only five drachms (or 300 grains) neither of these quantities contained so much sugar as the first, but the last much less than the two former. He was ordered to live intirely upon cold fat meat, and beef-tea, with eggs at supper. To take the hepatised ammonia in mint-water, and to use the nitric acid, diluted with water, for common drink; and an opiate, with rhubarb, at bed time. He persisted very rigidly in this plan for a few days, when, on account of the nauseating effects of the hepatised ammonia, it was discontinued. The quantity of urine

was

was already reduced to seven pints daily, and had nearly lost all remains of sweetness to the taste and smell. Indeed it tasted vapid, and somewhat sour, and had scarcely any urinous quality. On the 25th, one pint of the urine yielded an extract weighing only half an ounce, and two scruples (or 280 grains) which was highly urinous in colour, smell, and taste. All the Diabetic symptoms are now rapidly declining. The urine has a strong urinous flavor, but it is still rather straw coloured. It deposits a considerable quantity of brick coloured sediment, which consists apparently of the lithic acid. Its average daily quantity is not more than five pints and a half; and nearly one pint less than the liquids which he drinks. He consumes almost two pounds of meat in the same period, exclusive of two eggs at supper. He can now sleep without being importuned to make water more than once or twice in the night, and feels strong enough to assist in the domestic services of the house. The urine no longer stains his linen. His propensity to sweating is returned, and the aching, and weariness in the muscles and joints, are seldom experienced.

October

October 11*th.*

The patient is now in a state of convalescence, and there is every appearance of his being speedily restored to perfect health. During this interval, the Diabetic symptoms were renewed, in consequence of the patient having been allowed milk-porridge at supper. He has however, daily consumed six ounces of toasted bread, and drank a pint of malt liquor after dinner, without making any unfavorable change in the properties of the urine. He takes a preparation of bark, with the vitriolic acid, and his loins are covered with a warm plaster. The daily average quantity of the urine does not exceed four pints and a half, and is less, by a pint, than his drink. On being weighed this day, he is found to have gained fifteen pounds since his admission into the house. One pint of his urine was treated as before, and the residuum amounted to three drachms and a half, (or 210 grains.) In colour, smell, and quantity, it exactly corresponds with the extract obtained from healthy urine.

REMARKS

That this is a well-marked case of Diabetes Mellitus, will not, I presume, be called in question.

question. It may indeed, be deemed rather premature, to pronounce it absolutely cured; yet the total disappearance of the characteristic Diabetic symptoms, the increased bulk, and vigor of the patient, and his absolute freedom from any other apparent malady; are circumstances that would warrant such a conclusion.

If it were possible to place the patient in such a situation, as to secure a steady adherence to a proper regimen and diet; I should feel an entire confidence in his remaining free from any return of his complaint. But the hard necessity of his lot, is such, that a numerous offspring must be supported by his labour; and that labour will not suffice, I fear, to procure him a moderate supply of animal food, and such other means of prevention, as will be likely to obviate a relapse. What can be done however, to assist his efforts, shall not be wanting; and I hope and trust, that at a future period, it will be in my power, to bring forward his case, as one of the few instances where this formidable disease has been effectually, and permanently subdued. Since the above was written, the patient has continued free from complaint, and was discharged *cured*, on the 20th of October.

Since

Since the foregoing reports, and part of the subsequent experiments on Diabetic urine, were arranged for the press, I have been consulted on the following case of Diabetes Mellitus. It serves to corroborate an opinion which I had formerly entertained, that this disorder too often escapes the notice of medical practitioners, in consequence either of their neglecting to expose the urine to evaporation and analysis, or their unacquaintance with the history and characteristic symptoms of the disease. It was chiefly with a view to enforce the necessity of attention to both these points, and to impart the result of some experiments on the urine of the patient, that I have related the following particulars of a case, which has been too short a time under the method of treatment before described, to permit any certain conclusion to be drawn respecting its efficacy.

Mr. D. Assistant Surgeon, to a Cavalry Regiment, called me into consultation, about a month ago, with his friend Mr. Hamilton, Surgeon to the Manchester Infirmary. Mr. D. informed me, that he suspected his complaints to originate from an affection in the chest, (probably about the heart, or the large blood vessels) which was accompanied with extreme thirst,

thirst, hectic fever, and great emaciation. He had formerly consulted a celebrated professor of medicine, who considered these symptoms to depend upon general debility (the consequence of temporary habits of excess) and that they had been much aggravated by the patient suddenly altering his mode of life, and adopting a rigid plan of abstinence. He therefore advised a moderate use of wine, and animal food, and a gradual return to his usual occupations, and least injurious habits: But little or no advantage was reaped by this plan. The patient had then recourse to a strict vegetable diet; this change agreed less with him than the former, and he remarked to me with surprise, that *it even aggravated his thirst and debility.* I found his pulse 120, feeble, and fluttering. He mentioned his thirst to be so excessive, that he had sometimes consumed, for more than a year past, two gallons of cold water, or other beverage, during the night; and he believed the urinary discharge to correspond with the quantity of drink. Upon inquiry, if he had investigated the sensible qualities of his urine, he informed me, he had often examined this fluid, and found it highly animalized, not in the least (as he once suspected might be the case)

case) resembling the properties of Diabetic urine. Misled by this statement, and finding the patient to labour under a dry, teazing cough, pain in his chest, hectic flushes, and occasional irregular action of the heart; I was inclined to consider his disorder as depending on a diseased state of the lungs, complicated with an organic affection of the heart. But after discovering, that in addition to the above symptoms, the patient complained of *Bulimia*, a *dry, harsh,* and *totally unperspirable skin,* I expressed my full conviction, that he was afflicted with confirmed Diabetes. At my request, a portion of the urine was transmitted to me for experiment. It exhibited all the sensible properties of Diabetic urine, (and a large quantity of residuum*, resembling treacle, was obtained from it by evaporation) but to the saccharine taste, an acid flavor was added in a greater degree than I had ever before noticed. In addition to the above statement, I shall transcribe the patient's short decription of the commencement and progress of his case, as it furnishes farther proofs of the influence of certain pre-disposing and occasional causes; and also confirms the probability of

* The farther analysis of this substance will be detailed among the subsequent experiments on Diabetic Urine.

my

my opinion, that Diabetes is a disease which often escapes detection.

" I date the commencement of my Diabetes in March, 1804. although probably it began earlier. For some years prior to its attack, I had lived very freely, particularly in the use of malt liquor, and shrub-punch; and sugar was not forgot in my morning tea. During this period, I was easily bloated in the face, which frequently turned of a blue or black colour at meals; but there was no increased flux of urine. In September, 1803, I had a Peripneumony, which left behind it an irregularity of the action of the heart. In March 1804, I was seized, without any known cause, with a burning fever, and most intense thirst, with a bound body, and great debility; frequently after having drank a quart of water, my thirst was greater. I felt that the system did not need the dilution; but the mouth and fauces were so parched, as to require frequent moisture. I had also from that period, a constant Bulimia. The quality of the urine I cannot exactly mention. These symptoms have continued, more or less, ever since; and sometimes wonderfully aggravated and frequently greatly relieved. A bound body constantly made every thing worse. My debility was at times excessive, I fed chiefly

on

on vegetable soups, in order to mitigate the fever (of which I had constantly two paroxysms each day) to which I attributed all my complaints. I never took any medicines."

I strongly recommended the patient to abstain from all vegetable food; to take some tonic pills, composed of bark and steel, and water acidulated with nitric acid, for common beverage; opium combined with rhubarb, at going to bed; and to use a warm bath, at 98. When very faint and low, he was permitted to sip a little ardent spirit and water. After persisting a few days in the above plan, he removed to Chester, in order to become stationary for a considerable time. He immediately consulted an eminent Physician, Dr. Currie, who entirely agreed with me concerning the nature of his complaint. The following extract of a letter from the patient, dated December 17th, will best explain the present state of his malady, and the effects produced by a very short trial of the plan of cure.

"On consulting Dr. Currie, he pointed out a regimen consisting of animal food, and wished me to take some hepatised ammonia, in pills, which on the first trial, I was obliged to leave off, owing to the derangement they occasioned in my whole system. In short, his plan perfectly coincided with yours. It is not

not long since I commenced the proposed plan, owing to the violence of my cough, which does not seem to abate, notwithstanding the use of laudanum, and antimonial wine at bed time; but short as the period has been, my thirst has been greatly relieved, my hectic bloated appearance changed, and my appetite certainly more natural. I may just observe, that two days since, my urine had become quite natural; to day it is perfectly sweet. On adding some yeast to three quarts, and being put into a proper temperature, fermentation took place, and a very weak vinegar was formed. My skin is softer, and my urine corresponds with the quantity of my drink."

EXPERIMENTS

On the Diabetic Urine,

of

Barratt, O'Brien, and Beswick.

The existence of saccharine matter in the Diabetic urine of these patients, was perhaps sufficiently proved by the sensible properties of the fluid; but it was still thought proper to determine the fact by experiment. Besides the present was deemed a favorable opportunity to ascertain another point of practical importance,

importance, on which some eminent practitioners had differed in opinion. I allude to the experiments of Dr. Lubbock, in opposition to those of Dr. Rollo, and others, which seem to lead to the conclusion, that animal diet is incapable of destroying the saccharine quality of Diabetic urine. There is likewise another subject of dispute, which was thought deserving of investigation. Dr. Rollo, and Mr. Cruickshank are of opinion, that the extract of Diabetic urine is almost entirely composed of saccharine matter; and consequently, that in this substance there exists a want, if not a total deficiency, of the *urea*, which forms a constituent principle of healthy urine. This opinion is further confirmed by the experiments of* Messieurs Nicolas, and Gueudeville, who have described the absence of the *urea* as a leading characteristic of Diabetes. On the contrary†, Dr. Bostock, in his ingenious paper on Diabetes, maintains that he has procured the *nitrate* of *urea* in abundance, from the extract of Diabetic urine.

The determination of these disputed points can only be decided by an appeal to repeated experiments. I possessed neither leisure nor

* Annales de Chimie, Tome 44, page 62.

† Memoirs of the London Medical Society, Vol. VI.

sufficient

sufficient experience to enter upon a train of chemical investigation, with that closeness and accuracy which the subject justly demanded, and was obliged therefore to be satisfied with *a few general experiments*, but in conducting a part of them, I was favored with the assistance of an able Chemical Philosopher, my friend Mr. Dalton.

The usual specific gravity of the urine of these patients, was ascertained to be 104. On the 25th of December, prior to the abstinence of Barratt, from vegetables, and at a time when his urine amounted to thirty-two pints in twenty-four hours, one pint of it was slowly evaporated, and twelve drachms of an extract resembling treacle, in taste and appearance, was produced. This syrup, when treated with nitric acid by heat, gave carbonic acid, and azotic gas, in nearly the proportion of one half each; but no nitrous or inflammable gas. A quantity of extract obtained from healthy urine, by evaporation, was submitted to the same experiment, and with a similar result, as to the production of nitrous and azotic gas. But in the latter instance, a large quantity of the nitrate of *urea*, remained at the bottom of the retort; probably the whole original quantity. Whereas in the experiment with Diabetic urine, no pre-

cipitate was observed, either before or after the expulsion of the gases. The same phænomena were exhibited by repeating the experiment upon the extract from O'Brien's urine, which weighed thirteen drachms, and very exactly resembled, in its sensible properties, that of Barratt's. Upon adding a portion of nitric acid to a quantity of the residuum belonging to each patient, no precipitate was thrown down; and immediately upon the ebullition ceasing, the solution became of a clear dark brown. But when the same acid was added to a portion of extract obtained from the urine of a *healthy subject*, a great number of minute, and bright pearl-coloured chrystals, were speedily deposited, composed undoubtedly of *urea*, and nitric acid. An equal mixture of healthy and diseased extract was treated in a similar manner with nitric acid, and a proportionate quantity of *urea* was instantly precipitated, as in the former experiment. But as Dr. Bostock had obtained *nitrate* of *urea* along with the oxalic acid, by treating Diabetic extract with nitric acid, and carefully attending to the different stages of chrystallization, I felt desirous to repeat his experiment, and employ similar caution in conducting it. I therefore mixed one ounce of Diabetic extract, obtained from O'Brien's

O'Brien's urine, with six times its weight of a mixture of equal parts of water, and nitric acid, in a tubulated retort, to which a receiver was fitted. The liquor was made to boil until the nitrous gas was all expelled, when it was poured into an open wide vessel. Upon cooling, a number of chrystals were formed, which, from their slender, needle-like shape, and adherence to each other, at about an angle of 45, were evidently the oxalic acid. When carefully collected, and dried upon blotting paper, they weighed 200 grains. But, upon the closest inspection, no traces of *urea* could be discovered. The experiment was afterwards repeated, and the process of chrystallization interrupted, but with no better success. The extract from O'Brien's urine was treated in a similar manner, and with exactly the same result. Two hundred grains of oxalic acid having been produced, but no other chrystals could be detected.

Another portion of Diabetic extract from O'Brien's urine, was, in the course of a few days, again submitted to experiment, and care was taken to push the process of chrystallization to the utmost extent. The oxalic chrystals being carefully separated upon their first formation; and the residuum, which

formed a thick tenacious mass, being again treated with nitric acid, a confused set of chrystals, were by these means obtained. Part of them seemed to be of a flat lamellated texture, and so entangled with the slender oxalic *spiculæ*, as with difficulty to be separated. But on farther, and more minute inspection with the microscope, they appeared to consist solely of fragments of the oxalic chrystals, closely and confusedly cemented together, in consequence of the glutinous and tenacious consistence of the residuum, having prevented their assuming a regular chrystalized form. A portion of these lamellated chrystals being added to lime water, a copious precipitate was thrown down, just in the same manner as happened when the needle-shaped chrystals were employed. Although these experiments were not sufficient in number to warrant a *general* conclusion as to the *non-existence* of *urea*, in Diabetic urine; yet, when added to the numerous proofs of a similar kind, which have been brought forward by Mr. Cruickshank, and the French chemists, they form altogether a body of evidence almost decisive upon the question.

In order to determine the progressive effects of animal diet, on the saccharine properties

perties of the urine, a portion of the extract belonging to each patient was submitted to experiment, at the expiration of three weeks, from their adopting this regimen. It was found, that one pint of urine afforded nearly one third less extract than was obtained by the first experiment, and likewise, that this substance had acquired some degree of urinous odour and taste: Yet, notwithstanding, the chrystals of oxalic acid again made their appearance, although in a much inferior proportion: moreover, during the progress of each patient's treatment, when the urine betrayed, by its sensible properties, no trace of saccharine impregnation, and even the *nitrate* of *urea* had been obtained, in like manner, as occurred in the experiment with healthy extract; yet still a portion of the Diabetic residuum yielded some oxalic acid, when operated upon in the usual way. The residuum which was obtained from Beswick's urine, on the day of his admission, exhibited a considerable portion of oxalic acid, when treated in the usual manner; and on mixing it with nitric acid, no precipitate was obtained, but the solution remained of a bright and deep brown colour, as in former trials. During the farther progress of the patient towards amend-

amendment, a solution of the extract in nitric acid let fall a precipitate, which increased in quantity in nearly the same ratio, as the Diabetic symptoms decreased. The vessels which contained the different portions of extract were all exposed in a place, where flies had ready access to their contents. I found many flies entangled in the vessels containing the extract, which was obtained the first and second time, but none in the others. This affords a tolerably convincing proof of the saccharine impregnation of the former, and the want of it in the latter.

But in order to satisfy myself more completely, that Beswick's urine, at his first admission, was devoid of *urea*, I instituted the following comparative experiments. Two drachms of healthy, and an equal portion of Diabetic extract, were dissolved, by trituration, in eight drachms of heated alkohol. Both solutions were exposed to evaporation in a water-bath, and the dry mass which remained of each, was carefully examined and compared. The Diabetic residuum tasted agreeably saline, and sweetish, and gave out the odour of burnt sugar; while on the contrary, the other exhibited a highly urinous, and animalized smell, and had an acrid, and peculiarly

peculiarly saltish taste. Upon re-dissolving both these substances in warm water, and adding nitric acid, a copious and pearly-precipitate ensued, in the solution of healthy extract; but the Diabetic mixture exhibited no traces of precipitation. The extractive Diabetic mass was exceedingly dark-coloured and tenacious, but the healthy extract was free from tenacity, and only of a deep brown.

The non-existence of *urea* in Diabetic urine, is still farther demonstrated by the following experiments on the extract, obtained from the Surgeon, whose case was last related. As the patient had only just entered upon a plan of animal diet; and as the disease existed under its most confirmed and exquisite form, I considered the present to be a very favorable opportunity to ascertain the point in question. Three quarts, wine measure, of this patient's urine, were therefore slowly evaporated, by the aid of steam, to the consistence of a thick dark-coloured syrup, resembling treacle that had been boiled. Its taste, and smell, were purely saccharine. Six drachms of this extract were then agitated together, in a convenient sized bottle, with four ounces of alkohol; a gentle heat being at the same time applied, to make the solution more

more compleat. The bottle was then put aside for a few days, till the extract had subsided. The alcohol solution was then decanted into a retort, and distilled by a cautious and gentle heat, till about five drachms only remained. The retort was placed at rest for several days, but no traces of chrystallization could be perceived, nor did the mass exhibit the least discoverable smell or taste of *urea*. The whole of the extract, obtained from three quarts of urine, when collected into a florence flask, and evaporated to the consistence of boiled treacle, weighed six ounces and a quarter, avoirdupois.

General Inferences resulting from the foregoing Cases, Observations, and Experiments.

1st. That it is to the sagacity of Dr. Home, we are chiefly indebted, for hints towards a successful mode of treating *Diabetes Mellitus;* and that Dr. Rollo is justly entitled to the praise of greatly enlarging our views, both of the theory, and practice of this disease.

2nd. That an abstinence from vegetable, and the employment of animal food, together with the nitric acid, blisters to the loins, opiates, and the warm or tepid bath, comprehend the general method of cure; and that bark,

bark, astringents, and alkalies, either alone, or combined with sulphur (such as the hepatized ammonia, recommended by Dr. Rollo) afford little, if any assistance in subduing Diabetes, or even arresting the progress of its characteristic symptoms.

3rd. That the above means, if duly persisted in, are capable of effectually curing Diabetes Mellitus in its incipient state, when unaccompanied with any dangerous organic affection; and that even in the most acute, and aggravated instances of the complaint, a steady perseverance in a proper regimen will arrest the progress of the Diabetic symptoms, and bring the patient into a state of convalescence.

4th. That in order to restore the patient to general health and strength, an admixture of vegetable, with animal food, is to be gradually and cautiously entered upon, as soon as ever the saccharine impregnation of the urine, and the voracious appetite have disappeared.

5th. That it appears from Barratt's case, great attention should be paid to the state of the *primæ viæ*, after the cessation of the Diabetic symptoms, as the tone of the stomach remains, for some time, much impaired, and the bowels also become torpid, and are liable

to

to dangerous inflammation, if evacuations be not speedily procured.

6th. That indulgence in spirituous liquors, exposure to cold and wet, a habit of profuse sweating, the immoderate use of acid drinks (such as sour butter-milk and whey) excessive labour, joined to hard-fare, and the depressing passions, are among the most frequent predisposing causes of the disease.

7th. That Phymosis is no more than an occasional symptom in Diabetes Mellitus, and can only happen when the prepuce, in its natural state, is so far elongated as to cover the glans; and that it seldom, if ever, does occur, until the disease has been some time established.

8th. That in some very protracted and severe cases, a long and rigid abstinence from every species of vegetable matter, was not found adequate to destroy the existence of sugar in the urine; for when the sensible qualities of this fluid did not point out the least saccharine impregnation, yet, on exposing an extract obtained from it by evaporation, to the test of chemical analysis, it was found to contain more or less of the oxalic acid.

9th. That the liquid *egesta*, in the confirmed and more advanced stages of Diabetes Mellitus

Mellitus, almost uniformly exceeded the amount of the liquid *ingesta;* and that sometimes the combined quantity of both solid and fluid *ingesta,* did not equal the urinary *egesta.* It is therefore highly probable, that the excess of the latter was supplied by increased absorption of fluids from either the surface of the skin or lungs.

10th. That Diabetes Mellitus is frequently accompanied with Pulmonic disease, and often terminates in *Phthisis Pulmonalis.*

11th. That Males are more liable to the disease than Females; and that this may perhaps arise from the greater exposure of the former to those occasional causes which are enumerated in No. 6.

12th. That the excess of extractive matter in Diabetic urine, is for the most part, in proportion to the violence and severity of the disease, especially when the patient is under no restraint of diet; and that the quantity of this extractive matter is speedily reduced by the use of animal food, and this reduction, to nearly the healthy standard, is one of the leading indications of an abatement of the malady.

13th. That there exists a deficiency, if not a *total want of the urea,* in the urine of such cases

cases of Diabetes Mellitus as are distinctly marked, and where the disease has attained its acme; and that the restoration of this principle to the urine, is among the most certain signs of a removal of the disease.

After the foregoing experiments and remarks had been prepared for publication, I was induced to communicate to Dr. Bostock, such parts of them as were opposed to the inferences which he had drawn, from his analysis of Diabetic urine. At the same time, I transmitted to him specimens of the Diabetic extract, belonging to the two patients from whom I had obtained a similar product for my experiments. Having formed a high opinion of this gentleman's attainments, both in the science, and practice of chemistry, I requested he would repeat the mode of analysis, which he had adopted in the case that fell under his observation, with both the specimens I had sent. It would then more clearly appear, whether my suspicions of some error having crept into his conclusions, were well founded, or whether I had not been led astray by some fallacy, either in my experiments or inferences. With this request he obligingly complied; and with a candor which ever accompanies a philosophic mind, he confessed, that

that his opinion concerning the existence of *urea* in *Diabetic urine*, was too hastily formed, as it entirely rested upon the *visible* appearances of the substances which he procured, and which more accurate tests proved to be erroneous. But as this is a subject highly interesting, both in a chemical and medical point of view, and as Dr. Bostock's reasons for primarily adopting, and subsequently abandoning his opinion on the nature of Diabetic extract, will be best explained in his own words, I shall transcribe from his communications what may be necessary for this purpose. In answer to my first letter he remarks.

" My experiments on Diabetic extract, to which you refer, were made without any previous hypothesis; and the paper, in which I gave an account of them, I regard principally as the relation of matter of fact. The results of the action of nitric acid upon the extract, seemed to me sufficiently distinct; and they appeared so to some of my scientific friends to whom I showed them. Mr. Charles Aikin, of London, was on a visit to me at the time when I was engaged in the experiments; and it was, in a considerable degree, from his approbation of them, that I was induced to transmit the account of them to

to the Medical Society. The results were shewn to Dr. Birkbeck, late of Glasgow, to Dr. Thomson, of Edinburgh, and I think to Mr. W. Henry. I mention these circumstances, in order to show, that my conclusions were not without the support of some of these, the best qualified to judge on such subjects."

"I must indeed confess, that I rested my opinion entirely upon the *visible* appearance of the substances which I procured, and although they seemed to myself, and my friends, sufficiently well marked, there is undoubtedly room for error. I should also observe, that the particular case upon which I operated, may have had the extract in an unusual state; in some respects it certainly was so, in as much as it easily assumed the solid form, although I was induced to attribute this circumstance, more to a difference in degree, than in kind. All that now remains for me to do, is to repeat the experiments, with the substances which you sent me, and to notice the results; and if I find that I have still a quantity of the extract of my former patient by me, I will again subject it to the action of the nitric acid, and observe the phenomena with more accuracy."

I sent to Dr. Bostock, soon after the receipt

ceipt of the above communication, a portion of the extract belonging to my last patient, and begged he would submit it to examination, as I considered it the purest specimen of saccharine extract, that I had ever obtained. Although it is not possible, by verbal description, to convey an *adequate* idea of the different specimens alluded to in the following communication; yet the subject may be so far understood, by the clear and distinct explanation which the author has given of the result of his experiments, that I judged it proper to detail the whole narrative. I am happy to find, that the ingenious writer has it in contemplation to pursue a subject that still requires farther elucidation, and which he is so well qualified to undertake.

"I send you a small quantity (marked No. 1.) of the extract from the urine of my former patient, J. R. which was obtained merely by the process of slow evaporation; it has retained its present form for between two and three years. It has more of the saccharine appearance than any Diabetic extract which I had ever an opportunity of observing; and, except the case communicated by Mr. Shirreff, to Dr. Rollo, of any of which I have seen a printed account. Still, however, it is not pure

pure sugar. This I think is sufficiently evident from its sensible qualities, and is further proved, by its refusing to crystallize, notwithstanding every means that I used for that purpose. That the extract is not pure sugar, I also infer, from the effects of the different reagents upon the urine, as stated in my paper; they will, I believe, be found materially different from those produced upon a solution of sugar, to which the salts of the urine are added. This is a point which I have not indeed ascertained with that accuracy that it deserves, and which I propose to take an early opportunity of bestowing upon it. At present I shall confine myself to the effects of the nitric acid, as this is more immediately connected with the subject of your letter, and forms the questionable part of the deductions from my former experiments. My plan of proceeding was to add six times its weight of a mixture of equal parts of nitric acid and water, to a portion of the substance to be examined. This was subjected to a boiling heat, until the greatest part of the nitrous gas was separated, and the fluid was reduced to somewhat less than half of its original bulk; this I found to be the state in which it the most readily crystallizes. The residual fluid

fluid was then poured off, a little more nitric acid added, it was again heated, and afterwards set by a second time for crystallization. As a standard experiment, I first operated upon a portion of sugar; the crystals obtained are marked No. 2 and 3, and present, in every respect, the same appearance. I next performed the same process upon an equal quantity of the Diabetic extract from my patient, J. R.; the first crystallization, marked No. 4, seems to be from oxalic acid, the second marked No. 5, exhibits a very different appearance, certainly much resembling the substance produced by the action of nitric acid upon *urée;* and, I think, different from that, depending upon a mere irregularity in the formation of the crystals of oxalic acid. These appearances exactly coincided with those in my former experiments. I next operated upon the extract which I received in your first parcel, beginning with that marked No. 1*. This was subjected to the usual process with nitric acid; the two crystallizations seemed exactly similar to each other, and by mistake were mixed together; they are marked No. 6. they seem to be merely oxalic acid, although somewhat confused in its

(* Beswick's.)

crystallization, and I think, essentially different from No. 5. The same results were obtained from the extract of your patient, marked No. 2*, they are inclosed in No. 7 and 8. In these two cases the Diabetic extract exhibited its most common form, that of a dark colored glutinous fluid, almost precisely similar to treacle. The next experiments which I performed, were on the extract from your third case†; in this instance it had assumed the solid state, and was indeed so hard, as to require a considerable force to divide it into pieces; it was very similar to the substance produced by boiling treacle. The products obtained by treating this extract with nitric acid are contained in No. 9 and 10; No. 9, will be found to exhibit the usual appearance of oxalic acid, while No. 10, consists of the lamellated scales, like those which I obtained from my patient J. R. It seemed a little remarkable, that in this extract, which probably ought to be considered as the most saccharine of the three which you sent me, the chrystals should have assumed this particular form. So far appearances were rather in favor of my opinion; in order to put it to a farther test, I added a quarter of

(* O'Brien's.) († Mr. D's.)

its

its weight of healthy *urée* to sugar, and submitted this to the usual process with nitric acid. The results are in papers No. 11 and 12, and will be found to correspond with those in No. 4 and 5; and 9 and 10; *i. e.* the first crystallization exhibits the usual appearance of the oxalic acid, the second the lamellated scales. These results seemed still more in my favor, but I determined to apply the *decisive test* of *lime-water*, which in my former experiments I had unaccountably neglected. For this purpose I formed a solution of oxalic acid, in the proportion of 500 to one, and this was gradually diluted until the acid formed only $\frac{1}{10,000}$ part of the weight of the fluid, when one drop of it added to ʒj of lime water, produced a precipitate that was barely visible. A solution of similar strength was formed of the lamellated scales, and after being dropped into lime water, a precipitate was also produced. Hence I conclude, that my former inference was erroneous, that these scales consist of oxalic acid, and that we have no evidence of the existence of *urée* in Diabetic extract. Although it appears that this peculiar matter is oxalic acid, yet it still seemed that their arrangement was something more than the mere effect of con-

fused or imperfect crystallization, and I was anxious to discover, if possible, upon what its formation depended. As several of the reagents which I had applied to Diabetic urine, and which produced copious precipitates from it, were also active precipitants of mucus; I wished to observe what would be the effect upon the form of the chrystals, if a quantity of this substance mixed with sugar, was submitted to the action of the nitric acid. Accordingly three parts of sugar, and one of gum, were treated in the usual manner, the results are contained in Nos. 13 and 14. They do not materially differ from each other; at first view, they exhibit something of the lamellated structure, but upon close inspection, I think it will be found to depend merely upon the indistinctness of the crystallization. On account of the resemblance which the extract of my patient, J. R. bore to manna, I next subjected this substance to the usual process, and obtained the results marked No. 15 and 16. They will befound to consist of the oxalic acid, mixed with a quantity of a white powdery substance. which formed a crust at the bottom of the evaporating dish: this I apprehend is the oxalate of lime, but I have not yet had an opportunity of accurately ascer-

ascertaining this point. Nothing of the lamellated matter is visible in these papers. Here, for the present at least, my experiments on this subject terminate; I confess however, that I feel too much interested in them, not to hope, at some period or other, to investigate the matter more fully."

TABLE

THE following TABLE

Exhibits a Summary View of the Character and Termination of Eight Cases of DIABETES MELLITUS.

No.	Names.	Age.	Species of Diabetes.	How Discharged.	Subsequent Event.
1	Benjamin Piggin,	40	Diabetes Mellitus mitior,	Cured,	Unknown.
2	Mary Middleton,	36	Diabetes Mellitus mitior,	Cured,	Unknown.
3	Thomas Kay,	24	Diabetes Mellitus gravior,	Convalescent,	Unknown.
4	John Wild,	33	Diabetes Meilitus gravior,	Died,	
5	Thomas Whitehead,	50	Diabetes Mellitus mitior,	Cured,	No relapse.
6	George Barrat,	43	Diabetes Mellitus gravior,	Cured,	Died in Three Weeks from Enterites.
7	William O'Brien,	33	Diabetes Mellitus gravior,	Much relieved,	The Diabetic symptoms remain nearly subdued, but he is likely to sink under *Phthisis Pulmonalis.*
8	William Beswick,	52	Diabetes Mellitus gravior,	Cured,	No Relapse had taken place Six Weeks after his dismissal.

EFFECTS OF GALVANISM IN *PARALYSIS.*

MY experience of the influence of galvanism in paralytic affections, is not very extensive. But it has been sufficient to convince me of its superior efficacy as a remedy, where other means had failed. The facts are certainly too few to admit of a general inference in favor of Galvanism, when compared with electricity, and other powerful remedies in Paralysis; yet, I conceive the relation of even a few well marked and decisive instances of the successful application of the Galvanic principle in this disease, will serve to encourage farther trials, and consequently extend our hitherto limited knowledge of its medicinal powers.

Case I.

James Mc Cartney, Æt. 36. *Fustian Cutter, Admitted an In-Patient, April* 1*st,* 1805.

Was attacked four years since with Hemiplegia of the right side, attended with loss of speech and memory. He remained entirely helpless for six months, and it was more than a year before his mental faculties, and the power

power of using the limbs of the affected side, became partially restored. The muscles of the right arm and leg never recovered their wonted plumpness, strength, and sensibility. The patient has been much addicted to excess in spirituous liquors, and to great irregularity in his general mode of living. About a month ago he was suddenly attacked while walking, with Hemiplegia of the right side, accompanied by Vertigo, loss of memory, and involuntary discharge of urine. I find him now scarcely able to walk across the room, his speech is nearly inarticulate, and the corner of the mouth drawn on one side. The urine is often involuntarily discharged, his memory is not sufficient to enable him to reckon twenty; and his countenance appears sunk, and nearly idiotic. Pulse 64, and feeble. He was ordered to be blistered between the shoulders, and to receive, daily, electrical shocks to the number of fifteen; and likewise to have sparks drawn from the affected parts. The bark, with snake-root, and ginger, was also prescribed. The above plan was persisted in for eight days without producing any favorable change in the symptoms. As I considered the disease to originate from diminished energy in the brain, and to be unconnected with congestion

gestion or extravasation in that organ, I deemed the patient a proper subject for the experiment of Galvanism.

April 9th.

On this day all medicines were laid aside, and he was ordered to be galvanised. The method employed by Mr. Wilkinson*, was adopted in this and the subsequent cases. I began with half a dozen plates †, and applied the conducting wires in such a manner, as to direct the galvanic influence through the sensorium. The sensation was powerful and unpleasant, but by degrees he was able to bear a dozen plates. The galvanic fluid was likewise directed along the spine, and the upper and lower extremities, in as powerful a degree, as the patient's feelings would admit. The pulse rose, after the operation, from 65 to 75, and the patient remarked, that the diseased parts felt warmer, and less benumbed.

18*th.*

During this interval he had been regularly galvanised each day. The right arm and leg

* See Wilkinson's Elements of Galvanism, Vol. II. page 444.

† The plates were two inches and a quarter square, and the trough contained fifty of these.

were

were made alternately to form part of the galvanic circle, between the conducting wires, and the trough. He was able to bear, not only with impunity, but manifest advantage, an increase to twenty plates, when the brain formed a part of the circuit. No other internal or external means whatever, were employed; and he has also lived upon the common diet of the house. On the fifth day from the commencement of the plan, its good effects were very conspicuous. The incontinence of urine had abated, and the convulsive twitchings of the muscles of the face had nearly subsided; he could walk almost in a right line, and his steps were more firm and assured. The warmth and sensibility of the parts were also increased, and his speech was become more intelligible. He continued to improve daily till the 18th; at which period his speech and memory were nearly restored, the incontinence of urine had disappeared, and the muscles of the arms had so far recovered, as to enable the patient to use the dumb-bells by way of exercise. He was discharged cured on the 24th, being entirely free from any appearance of disease, except a light retraction of the muscles of the face, but, unattended with pain or any inconvenience.

venience. I have frequently seen the patient since his dismissal, and had the satisfaction to find, that he was able to pursue his usual employment of cutting fustian (which requires manual labor and dexterity) without suffering any relapse of his malady.

Case II.

William Knot, Æt. 6.

Admitted an In-Patient, May 13th, 1805.

He has been paralytic for more than one year. The muscles of the right side of his face are so contracted, as to occasion a great distortion of his features. The tongue is paralytic, and permits the saliva to drivel constantly from each corner of his mouth. His speech is so inarticulate as to be unintelligible, and his memory, and other faculties are greatly impaired. The upper and lower extremities of each side are so affected, as to render his gait like that of an intoxicated person, and he is unable to dress or feed himself. The palsy suddenly supervened to an eruptive fever, and various remedies had been applied to subdue it without effect. In treating so deplorable a case, it was thought proper to commence with the experiment of Galvanism. The fluid was cautiously

cautiously directed through the brain, and notwithstanding the power of four plates only were exerted, the patient appeared to suffer much pain and alarm from the operation. He was able to sustain the force of thirty-six plates through the spine, and both extremities.

This operation was daily repeated, and with a gradual augmentation of the Galvanic power. His improvement was speedy and decisive. On the 18th he was able to articulate some words with distinctness, and the involuntary flow of his saliva had nearly ceased. His gait was more steady and firm, and I had the pleasure to find he was able to sustain his body erect, and confine his steps in walking to the limits of a single board belonging to the floor of the ward, and which extended from one end to the other. The child was so conscious of the advantages he derived from the operation, as to express a wish for its repetition. It had now ceased to be painful, and only excited a sensation of warmth over the whole frame. His pulse invariably rose after the operation, at this period. Slight shocks were passed from below the coronoid process of the lower jaw, to the opposite side, so as to excite the muscles of the tongue, and larynx.

larynx. On the 20th, he appeared unusually low spirited, and languid, and complained of alternate chills and heats. The application of Galvanism was suspended, and on the 23rd, scarlatina made its appearance. The attack was mild, but he remained much debilitated for a week longer, when the use of Galvanism was resumed with the happiest effects. In the course of another fortnight, he was able to run up and down stairs with apparent ease. His memory and general faculties were become invigorated; and his speech was much improved, by transmitting the Galvanic influence through the muscles subservient to the voice. Indeed, with the exception of a tremulous motion of the arm, and a slight agitation of one leg after exercise, together with an *occasional* hesitation and stammering in his speech, he might have been considered as completely cured. However it was thought advisable to continue the use of Galvanism till the middle of July, when the symptoms last mentioned having remained stationary, he was sent home with a recommendation to return, if there appeared the slightest tendency to a relapse. I have not heard any further account, and am therefore disposed to believe, that he has not lost ground, should he not be perfectly recovered.

CASE

Case III.

April 21st, 1805.

A gentleman aged 68, was seized with a sudden and total suppression of urine, soon after drinking a large quantity of cold beer, when heated by violent exercise. The pain at the neck of the bladder, and sense of distention in that organ were intolerably severe, and he obtained no relief until two pints and a half of urine were drawn off by the catheter. This operation was regularly repeated three times in twenty four hours. He had tried, previous to my being consulted, the warm bath and other remedies without benefit.

A blister was now ordered to be applied to the pubes, and full doses of the tinctura ferri muriati, to be administered. No advantage being gained by these means, large doses of camphor were next tried, but with no better effect. The bladder was obliged to be emptied by the catheter, twice or thrice a-day. He persisted in this method, with the addition of the warm bath, and *uva ursi*, until the first of July, when all medicines being laid aside, he was ordered to receive galvanic shocks, by introducing one of the conducting rods into the

the rectum, while the other rod was applied to those parts of the pubes which were still sore from the blister. In an hour from the first operation, he was able to evacuate partially the contents of the bladder. The next day it was not necessary, more than once, to employ the catheter. On the 4th, the tone of the bladder was so far restored, as to render the instrument quite unnecessary, and on the 6th, he was able to expel the contents of the bladder with ease and due effect. The application of Galvanism was therefore discontinued.

Case IV.

Mary Marlow, Æt. *Six Months,*

Admitted an Out-Patient, December 6th, 1805,

This child, whose habit was uncommonly gross and fat, had been attacked with convulsions which terminated in Hemiplegia of the left side, The affected parts were cold, shrunk, and nearly livid. Very slight Galvanic shocks were passed through the brain, by applying one extremity of the wire to the left side of the head, and the other to the right arm. The Galvanic fluid was likewise directed along the spine; and the upper, and lower extremities were equally exposed to its influence.

influence. No perceptible advantage was reaped from the diligent use of this remedy, every day, for the space of three weeks.

Case V.

A Lady, Æt. 34, had been several months under the care of a respectable Surgeon in Rochdale, for a confirmed hip-joint case, and had undergone a great variety of treatment, with little or no benefit. Her Surgeon recommended a consultation with an eminent practitioner, Mr. White, of Manchester, and myself, which accordingly took place. The circumference of the nates of the diseased side was prodigiously enlarged, and the limb much shortened. The patient was an entire cripple, and had not the power of keeping her body in an erect posture. Her strength, appetite, and spirits, were greatly reduced from constant pain, want of sleep, and hectic fever. Although issues by caustic had been formerly tried, and one was still in an open state, another was ordered to be placed near the great trochanter, and the Galvanic influence to be strenuously exerted upon the diseased parts. An apparatus was procured for this purpose, and the operation regularly conducted, under the management of the attendant

attendant Surgeon, for the space of a few weeks. Bark and opium were likewise administered. An entire removal of the swelling in the first instance, and a gradual restoration to the use of the limb, were the result of the above practice. The cure was completed in two months, and the Lady still continues in perfect health. It is proper, however, to observe, that the discharge by the last caustic was more profuse than usual, and perhaps to this cause a part of the success may be attributed.

Case VI.

James Royle, Æt. 35.

Admitted an In-Patient, August 27th, 1805.

This man had labored under a general paralytic affection for nearly two years. He had lost both his speech and memory, and was reduced to nearly a state of idiocy. The upper and lower extremities were shrivelled, cold, and almost useless, as he was only able to walk a few yards, even with assistance. Recourse was first had to electricity and blisters; but these not availing, the patient was next submitted to the operation of Galvanism. After a regular, and diligent, but ineffectual

trial, for a period of nine days, without the slightest symptom of amendment, the patient was discharged incurable.

Case VII.

Henry Thelfal, Æt. 39,

Admitted an In-Patient, August 27th, 1805.

This case of Hemiplegia had existed for more than a year. The brain was much affected, as both his memory and speech were impaired; his left arm and leg were nearly useless. Metallic tonics, blisters, warm bath, and the bark, were tried in vain. Electricity produced some advantage, by increasing the warmth, and sensibility of the parts; these good effects were, however, but of short duration. Galvanism was now solely administered, not only the brain, but also the spine, and deceased extremities, were successively operated upon. The energy of the brain seemed to be considerably restored by the operation; as the patient improved, both in his recollection, and speech; but the limbs remained torpid and useless. No farther benefit having been obtained by a perseverance in the experiment, for the space of another week, the patient was dismissed, relieved.

Case VIII.

John Heywood, Æt. 35.

Admitted an In-Patieut, July 29th, 1805.

This is a paralytic affection, of some years standing. It succeeded an apoplectic attack, which deprived the patient of the power of motion, and speech, for many months. He now feels a sense of coldness and numbness to pervade the whole frame. He is only able to articulate monosyllables, and his memory is so impaired, as not to be able to recollect the three first letters of the alphabet, nor count as far as ten. Indeed, the sensibility, and irritability of the whole system, are remarkably blunted, and he is also liable to alarming attacks of vertigo. Galvanism was the sole remedy resorted to in this instance. On its first application to the sensorium, some benefit was evidently obtained. The recollection was so far improved, as to enable the patient to reckon twenty, without an error, and to repeat part of the alphabet; but beyond these points no advance was made. Upon application of the remedy to the trunk and extremities, he felt an increased degree of warmth and vigor; but these favorable symptoms were not permanent. His ideas of

consciousness were certainly strengthened, as he became more interested about his own situation, and did not, as usual, ramble from one place to another, without design or motive. Finding that no advantage was to be obtained by a further prosecution of the experiment, the patient was discharged relieved, on the 12th of August.

Case IX.

I was consulted in the Summer of 1805, by an Irish Barrister of eminence, who had laboured under Paraplegia, for several years, attended laterly with incontinence of urine. In consequence of my recent success in the two cases already described, I advised the application of Galvanism; but, as the patient's affairs called him to London, I recommended him to consult Dr. Baillie, to whom I transmitted an account of my experiments with Galvanism. Upon this representation, Dr. Baillie acquiesced in the propriety of making the trial; but the experiment was deferred until the patient returned to Dublin. The operation was attended with a partial, yet upon the whole, a favorable result. The tone of the sphincter of the bladder, was at first completely restored; but frequent repetitions

titions of the galvanic stimulus, were necessary to recover it from a state of diminished excitement. However, the nervous energy of the spine, and lower extremities, became more permanently invigorated. In a letter, which I received last month, the patient observes, "I am now an adept in the practice of applying Galvanism, and find that it always relieves me from the incontinence of urine, but this relief is not permanent; when the disorder shews a disposition to return, I am obliged to have recourse to my remedy. I am indeed, in other respects so far better, that I can hold myself upright, and I am able to walk a considerable distance with the help of a stick."

In this case there was no local affection of the spine to be discovered; but the disease seemed solely to depend on diminished nervous energy. Electricity, blisters, mercurials to the extent of a slight salivation, issues, and various other means had been formerly tried by the patient, without any benefit.

The

The following case of paralysis is of a kind so singular and deplorable, and furnishes such unequivocal testimony of the efficacy of Galvanism, that I think it entitled to particular attention; aad have therefore entered into more than usual detail of its history and treatment.

CASE X.

ANN COMPTON, *Weaver Æt.* 20,
Admitted an In-patient December. 22*d.* 1806.

Complains of the entire loss of motion and feeling in every part of the body, except the head, neck, and left arm. It appears to her that a ligature is bound tight round the neck, adjoining to each clavicle, below which, with the exception of the arm, every other part of the body is destitute of life. She feels no uneasiness from fasting, nor any desire for food; and according to her own expression, she is "only dry and hungry in the mouth." Indeed she is not conscious of any internal sensation, nor susceptible of the most powerful stimulus. Neither ardent spirit, very hot or very cold liquids, solids of a stimulant, or simple nature; in short, no kind of aliment affords any gratification, nor excites the slightest sensation in the stomach or bowels. The fæces and urine are both involuntarily and unconsciously discharged. So devoid of sensibility,

sibility are the upper and lower extremities, that a sharp pointed instrument, thrust under the toe and finger nails a few days before her admission, produced not the least sensation. Pulse 78, weak and fluttering, the eyes dim, and languid, and the whole countenance heavy and relaxed. The patient's general appearance is such as to afford scarcely any prospect of her recovery. Mr. Moore, Surgeon of Bolton, (the place of the patient's residence) obligingly furnished me with the following particulars of the previous history of the case, and its medical treatment: The patient was also capable of explaining herself on this subject.

She had generally enjoyed a good state of health till her marriage. About three years ago, when pregnant, was attacked with frequent faintings, and suffered much from obstinate costiveness. After parturition, on October 28th, 1805, was seized with a slight fever, to which incessant hysteric fits supervened, for the space of three weeks. During this attack the limbs and muscles of the face were dreadfully contracted, and her struggles were so forcible as to require two or three persons to restrain her. She slowly recovered from this illness, and remained in tolerable health

health till the 12th of last November; when, while sitting at her loom, she was suddenly attacked with excruciating pains in her left shoulder, that lasted for a few minutes, and then shifted into the left arm, which became swoln and black, and from thence the pains removed into the breast and abdomen. Here they continued for an hour, and then disappeared; leaving her destitute of all feeling and motion in the affected parts. In a fortnight she had partly recovered the use of the paralytic side; when she was again seized with the same symptoms, except that the pain remained longer in the chest and abdomen than on the preceding attack. After the termination of pain, a complete suspension of sense and motion in every part of the body, external as well as internal, with the exception of the head, neck, and left arm, immediately succeeded. An obstinate constipation of the bowels, and suppression of urine for three days, were followed by tolerably regular, but involuntary discharges of both the fæces and urine. In this state she continued more than a fortnight, previously to Mr. Moore's first visit. During his attendance, she had four or five fits, in which she struggled violently with her neck and left arm; but no motion,

voluntary

voluntary or involuntary, was perceptible in any other part of the body. Her speech faltered, and was sometimes totally extinct The difficulty of breathing was considerable; and upon some occasions she did not respire more than *once in a minute;* which fact Mr. Moore ascertained by looking at his watch. He prescribed some drastic purgatives, blisters, and a stimulating liniment; and as she scarcely ever slept, he administered to the amount of 80 drops of laudanum without any effect. Having reaped no advantage from this treatment, her friends proposed to send her to the Manchester Infirmary; but as Mr. Moore suggested, that she would most probably not survive the journey, they postponed her departure for a short time. No material alteration having ensued, within the period of a week, they determined to send her, although the surgeon declared he did not expect she could live many days.

December 22d.

She was ordered to be galvanised in the following manner. The force of 40 Plates (3 inches square) to be directed through the right arm, by applying the extremity of one rod to the top of the shoulder, and the other to the back of the hand. The muscles were thus

thus thrown into powerful contractions, and some slight degree of feeling produced. The chest and abdomen were separately made to form a part of the Galvanic circle, by directing the shocks, from the spine of the back and loins through each of the cavities; especial care being taken to stimulate the region of the bladder. The operation raised the pulse from 78 to 104. No other sensible impression was made by the Galvanic stimulus, except that the patient became faint and depressed. The shocks from 40 plates were administered for the space of ten minutes. The operation was ordered to be repeated daily: and the thighs and legs were likewise to be exposed to the effects of Galvanism.

December 22d—27th.

During this interval the patient has become more alive to the Galvanic impression. The pulse, upon an average, has been raised fifteen strokes in a minute by the operation. Transient pains have been felt in the right arm, and throughout the chest and abdomen, and the patient is now slightly sensible of the Galvanic influence in every part, except the lower extremities. An opiate with rhubarb has been taken each night, but without inducing sleep. This morning (27th), after the

the operation, she felt for the first time conscious of an inclination to make water, and was capable of exerting sufficient power over the sphincter of the bladder to retain the urine for some short time. This circumstance has given her inexpressible satisfaction, and inspired her with hopes of recovery. She now complains of some pain and agitation of spirits when Galvanised. Castor oil to be given occasionally when costive.

December 27th—January 3d. 1807,

A very material change has occurred to day (January 3d): the patient expressed a desire for food, and stated that she felt a sense of hunger, and emptiness at the pit of the stomach. She has daily acquired an increase of feeling in the bladder and rectum, and command over the muscles subservient to these parts. Three days ago, she became, for the first time, sensible of the galvanic influence in the legs and thighs, and complained, during the night, of more general pain than she had experienced since her first attack. Pulse 84 before the operation, 104 after. The general standard of the pulse is now 84, regular and firm. Her countenance is more animated, and bespeaks confidence and encreased bodily and mental vigor. After directing some powerful shocks

(on

(on the 2d) through the abdomen, she complained of griping and severe pain, with a slight deliquium. A carminative cordial was ordered, which soon relieved her. The number of plates were directed to be diminished, and the stimulus in general to be adapted to the increased sensibility of the parts.

9th.

Till the 5th she has gradually been recovering; but unfortunately, on the morning of this day, while attempting to reach at something with her sound arm, she fell from the bed upon the floor with so much violence, as to occasion sickness and fainting. In consequence of this accident, she became less perceptible of the Galvanic stimulus, and for twenty-four hours was deprived of nearly all internal sensation. Some volatile fœtids were prescribed, and, as she was much bruised, a stimulant liniment was ordered to be rubbed upon the injured parts. The next day the operation of Galvanism was resumed, and continued to the 9th with such success, that she not only recovered from the effects of the fall, but this day, she can stir the fingers of the right hand, and the sense of feeling is restored to the whole arm and shoulder.

Is

9th—15*th*.

Is now able to dress herself with her right hand, to which the force of 48 plates has been regularly applied. The legs and thighs have been at times insensible to the application of 60 plates. Indeed both the lower extremities feel cold, are somewhat ædematous, and rather of a purple color:—In every other respect the patient is surprisingly amended. The appetite is tolerably good, the digestion regular, and she has due command over the muscles of the rectum and bladder. Her internal feelings are more natural and comfortable. I directed a small blister of the size of a sixpence to be applied to the upper part of the thigh, near the head of the bone, and to the upper part of the foot, on the right side. Upon the application of the rods to each of the vesicated parts, the Galvanic shocks were powerfully felt. In consequence of this mode of administering Galvanism, the warmth and sensibility of the whole limb, became evidently and speedily increased. The same effects were produced by a similar mode of application to the left thigh and foot. The small ulcers were ordered to be kept open, and the rods to be applied to them as usual. She has been taking, twice a day, since the 13th, a dose of the decoction of bark and vitriolic acid.

On

16th—25th.

On the 20th an ulceration was produced by a small blister on the sacrum, and the shocks were directed from this part along the course of the thigh to the foot on each side. No sensation was produced by 60 plates to any part of the lower extremities, where the skin was whole, but a few plates excited much pain and powerful muscular contractions, when the ulcerated surface was exposed to the instruments. It was therefore necessary to be cautious in adapting the Galvanic power to the increased sensibility of the surface.

24th—27th.

The large trough of 60 plates being wanted elsewhere, the small one consisting of 50 plates, $2\frac{3}{4}$ inches square, is to be substituted; forty-four of these produced sufficiently powerful effects. During this interval, the patient, after each operation, has found an increase of warmth and sensibility in both extremities, and is capable of exerting some slight degree of motion in the knees and joints of the toes: The right side has received greater benefit than the left. On the morning of the 26th, 40 plates excited powerful sensations in the right leg and thigh; but were not so effectual in those of the left, although the surface was equally ulcerated on both sides. This day, the

the 27th, after the operation, the patient was able to move both of the lower extremities in various directions, and the feeling of the parts was considerably increased. The bark, and vitriolic acid were laid aside; and the common effervescing saline mixture substituted in its stead, with a view to remove a tendency to vomiting. Ordered her four ounces of red port daily.

27th—February 2d.

The power of 15 plates (on the 28th) applied to the right side, excited stronger sensations than 40 did on the 22d—25 plates directed to the left side, produced only an equal effect with fifteen to the right. The patient can plainly feel the pressure of the fingers upon any part of each leg and thigh; and she now complains of pain and soreness from the blisters. For some days past, she has been able to support the trunk of the body when sitting, and on the 29th, with the assistance of crutches, she could walk across the ward in an upright posture. The pulse is still raised from twelve to fifteen strokes by each operation. 31st, I found the patient walking upon crutches in the large adjoining ward. She was this day sensible of the Galvanic stimulus arising from 25 plates, when the rods were applied *indifferently* to *any part* of the legs and thighs. February 2d. she

was

was able to sustain the body without crutches, and to walk with facility on a level surface. She remarked that the power of motion and sense of feeling evidently increased after each application of Galvanism; but that she was not able to bear such powerful shocks as heretofore. The menses have never appeared since her last seizure; and the abdomen appears somewhat tumid. The use of Galvanism was continued to the 10th, when she was capable of walking up and down stairs without aid, and all the natural and vital functions seemed to be restored. She was ordered to be discharged *cured* on the following Monday.

In consequence of the successful treatment of this case and some others, Mr. Ransome, Surgeon of the Manchester Infirmary, was induced to make trial of Galvanism in an instance of paraplegia, which had resisted electricity and various other powerful remedies. He obligingly furnished me with the following history of the case.

Case XI.

Ann Mellor, aged about fifteen years, of a healthy robust constitution, was admitted an in-patient of the Manchester Infirmary December 31st, 1806, in consequence of a fall from

from the height of two stories, into a stone area; in her descent she first alighted upon an iron rail, and thence fell with her back violently against a wall. When I saw her, she complained of great pain in her back, a complete inability to move her lower extremities, with every symptom of an injury of the spine, excepting a suppression of urine. The bowels were so torpid, that the most powerful purgatives were for several days unable to procure even a scanty alvine discharge, but with the assistance of the warm bath and clysters, they were ultimately restored to their natural action.

On the 13th. of January, I directed electric shocks to be passed through the pelvis, and from the sacrum to each foot; the warm bath to be used every evening, and a stimulant embrocation to the affected parts. 20th. No amendment was produced; a blister was therefore applied to the sacrum, but although it discharged abundantly, and the irritation was prolonged till the 25th. by the Unguentum Cantharidis, no amendment was observed in her paralytic symptoms. The Galvanic fluid was now resorted to, and continued for four days; no alteration for the better taking place, and as she seemed desirous of going into the country,

with a hope that change of air might prove beneficial, she was therefore discharged, under a promise of returning in a fortnight, if no amendment was perceptible.

On the 16th. of February 1807, she was re-admitted, without the slightest improvement, and totally incapable of moving either a foot or a toe. 17th. I now directed three small blisters to be applied, one to the sacrum, and the other on the outer side of each thigh, just above the knee, and requested Mr. Hall (one of the apprentices, whose attention to this case claims my thanks) to apply the Galvanic fluid every morning upon the excoriated surfaces produced by the blisters. As her catamenia appeared on the following day, this operation was postponed till the 21st. I may here observe that no change in the sensibility of her limbs was produced by these blisters, those on her thighs caused but a slight inflammation of the skin, though they remained on for several days, and she was on the morning of the 21st. as completely paralytic as when admitted.

Upon the first application of the Galvanic fluid, she seemed sensible of its influence, though in no great degree; 50 plates each $2\frac{1}{4}$ inch square were employed. 21st, 22d, and

and 23d. No apparent change, except a slight degree of inflammation, where the rods were applied. 24th. Feels the galvanic fluid more sensibly, and the left knee was raised involuntarily from the right, upon which it rested. 25th. She was so much better to day as to sit up in a chair, and move her feet and legs, complaining much of the pain occasioned by the Galvanic operation. 26th, 27th. The same; 28th. To day, with the assistance of a crutch and stick, she stood upon her legs, walked from the ward into the passage, and returned. 40 plates only were now employed, and with apparently the same effect, or even greater than the 50 had produced on their first application. March 1st, 2d. She now walks with more ease than before, 30 plates used. 3d. To day she has laid aside her crutch, and walked with only the assistance of a stick. 4th. Still improving. 5ht. Walks to day without any assistance, and feels great pain from the Galvanic fluid when only 25 plates were employed. 6th. This morning she thinks herself quite well, and anticipates the pleasure of going home. 7th. She appears now entirely relieved from every symptom, and I have accordingly discharged her, cured.

From the preceding experiments, the follow-

ing general conclusions and observations may be drawn. 1st. That Galvanism *judiciously* administered is a safe and powerful remedy in most Paralytic diseases. 2d. That as far as three comparative trials allow of an inference, the efficacy of Galvanism in Paralysis is superior to that of Electricity. And if we compare the general result of the application of Galvanism in the nine cases now reported, with an equal number of similar instances treated by Electricity, or any other established mode of cure, the decision will, I believe, be in favor of Galvanism: For it appears that out of five cases of general Paralysis, three were restored, by Galvanism; and out of five partial instances of the disease, three recovered. 3d. That Galvanism agrees with Electricity in its sensible effects upon the body: for, like the latter, it increases the action of the arterial system, excites strong muscular contractions, heat, and even blisters upon the skin, and produces, when two powerfully administered, sickness and faintings. 4th when the brain is required to form part of the circle, the Galvanic influence ought to be very cautiously administered. Five plates, two inches and a quarter square, will in general prove sufficiently powerful at first; and even this number ought to be diminished, if violent

pain

pain, and vertigo in the head, tremors, or convulsive sobs, and tears, should be occasioned by the operation. 5th. If no sensible advantage accrue from a steady, and properly regulated application of this remedy, after a trial of a week or ten days, in Paralytic affections, especially where the sensorium is operated upon, its use ought to be laid aside; for if persisted in under such circumstances, the derangement of the system seems rather to be increased than diminished; at least the feelings of the patient are rendered more irritable and uncomfortable. 6th. When the pulse has become quicker and firmer, the local, as well as general temperature of the body increased; the feelings, both mental and corporeal, somewhat enlivened, and the altered secretions better regulated, it is proper to infer from such indications, that Galvanism may be persisted in with a fair prospect of ultimate success. 7th. Where both sensibility and irritability are so greatly exhausted, as not to render the patient susceptible of the Galvanic stimulus by the ordinary means; or where, from the unusual thickness of the cuticle, it forms a barrier to the transmission of the fluid, it will be necessary to excoriate the surface by blistering ointment, and apply the

the metallic points to the raw skin. But the pain and agitation, frequently induced by administering the remedy through so sensible a medium, must be guarded against, by adapting the number of plates to the increased degree of susceptibility.

Remarks on the foregoing Cases.

It appears sufficiently evident from the above recital of facts, that the Galvanic stimulus is an efficacious, though not certain remedy in Paralytic affections. I have long been in the practice of employing Electricity in the treatment of Paralysis, and sometimes with the happiest result. But as far as my hitherto limited experience will permit me to institute a comparison between the effects of Galvanism and Electricity in Paralysis, I am inclined to prefer the employment of the former to the latter, in all cases which appear to originate solely from a diminished state of excitement in the sensorium. I have repeatedly had recourse to Electricity for the relief of such symptoms as are described in Mc Cartney's case, where the long continuance of the loss of speech, distortion of the muscles of the face, and depravation of the intellectual faculties, denoted a high degree of collapse,

lapse, or impaired energy of the brain; but never with such speedy and decisive advantage as was obtained from the application of Galvanism. Indeed the superior efficacy of the Galvanic to the Electrical influence, was in Mc Cartney's case fairly put to the test. No perceptible advantage was derived from an assiduous application of electricity, for more than a week previous to the exhibition of Galvanism. It is certainly extremely difficult to point out any characteristic signs by which we may be enabled to discriminate between those affections of the brain, which depend merely upon diminished excitement, and those which originate from organic derangement of an incurable kind. Wherever Paralysis arises from tumors compressing the substance of the brain, or from a diseased alteration in its mass and structure, or from extravasation of a fluid in such a state or degree, as will not admit of its absorption; it will be readily admitted, that no benefit is to be expected from the employment of Galvanism, or perhaps any other remedy yet discovered. But what are the diagonostic signs of such incurable conditions of the brain? I confess myself unable to point them out with any certainty. I may venture to state, however, from

from a few observations on this subject, that such affections of the brain are for the most part insidious in their approach, gradual in their progress, and when once formed, they admit of little, if any, exacerbation or remission in their symptoms. But although no benefit can be rationally expected to accrue from Galvanism in such a calamitous state of the brain as has been just described; I am not aware that a *cautious* and *prudent* use of the remedy will prove certainly injurious. I am, however, enabled to affirm, that in those cases of Paralysis, where sense, motion, and intelligence, are greatly impaired, it is always imprudent to push the experiment beyond certain limits. If the patient's rest, appetite, and feeble sense of enjoyment, be evidently disturbed; if tremors, convulsive sobs, and tears, with other signs of increased irritability, should either immediately, or soon after the operation, supervene, it will be proper at least to suspend, if not altogether discontinue, the use of Galvanism. The necessity for caution is exemplified in the following brief statement of a fact which lately occurred. A Young Lady (the daughter of a late eminent physician) had labored under a general Paralytic affliction (which most probably originated

originated from an attack of Hydrocephalus internus, when an infant) for many years; and which had progressively deprived her of all muscular exertion, and the power of speaking louder than a whisper. She had some years before, upon her Father's consulting me on the subject, submitted to a seven weeks trial of Electricity, under every form and degree which I considered most likely to be beneficial. No advantage was derived from the experiment. It was then my opinion, that the complaint depended on some internal organic derangement of the sensorium. She was however, strongly recommended last year, when at Bath, to make a trial of Galvanism. The experiment, I have every reason to believe, was skilfully conducted. Its effects however, were not only unproductive of any advantage, but very distressing to the patient's feelings, and injurious, for a time, to her general state of health.

It may not be improper to remark here, by way of caution, that I have been more than once disappointed in communicating the Galvanic influence to a patient, notwithstanding the skin had been duly prepared by moistening it with a proper mixture of nitric acid and water, and covering it with metallic leaf, and although

although other patients, treated in a similar manner, had experienced at the same time, the Galvanic sensation in its due force. This failure I found to arise from some peculiar condition of the skin (perhaps increased thickness?) for upon the application of the wire conductors to another part of the same limb, which had been in like manner prepared, as in the first attempt, I was able to succeed with the greatest ease.

Result of the Effects of Galvanism in Paralysis, &c.

Five Cases of general Paralysis, of which,

Cured	3
Relieved	1
Not Relieved	1

Five Cases of Partial Paralysis.

Ischuria	Cured	1
Hemiplegia	Cured	1
Hemiplegia	Not relieved	1
Paraplegia	Cured	1
Paraplegia	Much relieved	1

Hip Joint Case, One Cured,

On the Medical Effects of the White Oxyd of Bismuth.

In consequence of the favorable report of Dr. Marcet (See Memoirs of the London Medical

Medical Society, Vol. VI.) of the efficacy of this remedy in dyspeptic states of the stomach, attended with gastrodynia of the spasmodic kind, I was induced to give it a trial; and I am happy in being able to confirm the character bestowed upon it by that gentleman, and several eminent practitioners. As this medicine is only of late introduction, and its medical properties are as yet but little known, I consider it my duty still farther to excite the attention of practitioners to so important a remedy, by publishing the following cases. I must refer to Dr. Marcet's communication, for a concise and distinct account of what has hitherto been published of the medical, and pharmaceutical history of this medicine. It is necessary to observe, that in conformity to his recommendation, I employed the Oxyd of Bismuth, prepared by Allen and Howard, of Lombard Street. The specimen was of the utmost purity, and very different in its appearance, and properties, from that which is sold in the shops, under the title of *Magistery of Bismuth.*

Case I.

Richard Basford, Æt. 34. *Dyer, Was admitted an Out-Patient, June 11th,* 1805.

He complained of occasional gnawing pains at the stomach, accompanied with frequent eructations,

eructations, heart-burn, irregularity of appetite, griping, and alternate costiveness and diarrhæa. The pain for the most part seized him after a full meal, and was then so acute, as to compel him frequently to lie across the arm of a chair, or over a table, with a view to compress the stomach and bowels. The spasm generally terminated by sickness and vomiting, when the contents of the stomach were rejected in a state of great acidity; but occasionally the paroxysm was removed by a spontaneous diarrhæa. He was much reduced in flesh and strength, by a long continuance of his complaint. As I conceived the disease to depend upon a highly irritable, and debilitated state of the stomach, various medicines of a tonic, and antispasmodic kind were prescribed. Bitters and astringents, such as Quassia, Colomba, Bark, and Gum-kino, were exhibited, both in a separate, and combined state; and to obviate the occasional symptoms of spasm, and excess of acid; opiates, alkalies, and absorbents, were also administered. By this plan, which was persisted in with tolerable regularity, for more than two months, the most distressing symptoms were for a time relieved, but never completely subdued. On the 16th of September, the

the whole train of morbid symptoms recurring with accumulated violence, a blister was applied to the pit of the stomach, and the discharge and irritation were kept up by a stimulating ointment. The mineral acids, both nitric and muriatic, were exhibited as antizymies, and asafætida glysters with opium, injected to alleviate the violence of the spasms. A mitigation of the worst symptoms by these means, was once more obtained; and the attendance of the patient in consequence, became less frequent at the Infirmary. On November the 18th, I saw him in a state of extreme distress. The spasms, accompanied by pain and vomitings, had occurred so frequently, that little nourishment could be supposed to enter the system. His strength and spirits had failed, and he was unable to follow his employment. At this period I first met with Dr. Marcet's observations, and as soon as the Oxyde of Bismuth could be procured, the patient was ordered to enter upon its trial. Five grains of this medicine mixed with twenty-five grains of Gum Tragacanth, was exhibited three times a day. After he had taken nine doses, he found himself essentially relieved. The duration, and violence of the spasms, were both diminished, his vomitings

vomitings abated, and what he threw up had lost its acidity. The medicine had produced no one disagreeable effect, and was therefore ordered to be repeated, twice or thrice a-day, according to the urgency of the symptoms. On the 27th, I had the satisfaction to find, that the spasms, vomiting, and pain, had entirely ceased. The patient's stomach could now sustain a due portion of food with impunity, and except a slight griping with diarrhæa, especially after meals, and some degree of anorexia, he might be considered completely cured. In order to obviate the tendency to diarrhæa; gum kino, and opium, were administered, along with the powders. December 20th. the patient has suffered no relapse, and is now in excellent health. Upon farther inquiry, I find he had formerly been a hard dram drinker, and also much exposed to various hardships as a soldier.

Case II.

Thomas Davies, Æt. 55. *Weaver,*

Admitted Out-Patient, Dec. 24th, 1805.

This case was nearly the counterpart of the foregoing one. The patient had been long in the army, and much addicted to dram-drinking. The spasms in his stomach had tormented

tormented him for more than a year, and were always aggravated after eating. He suffered more from flatulency than the former patient, and from age, habits of excess, and length of attack, his constitution was more debilitated. He was subject to external hæmorrhoids and costiveness. The contents of his stomach were often so extremely acid, as to excoriate his mouth and lips. From my late success with the Oxyd of Bismuth, I entered with confidence upon its trial in the present instance. After exhibiting an active emetic of Zinc: Vitriolat: the bowels were completely emptied by castor oil, and half a drachm of the compound powder of bismuth, composed (as before mentioned) of one part of the Oxyd of Bismuth, and five of the pulv: gum; tragacanth, was ordered to be taken three times a-day. The patient found almost immediate relief. On the 28th, he reported himself free from sickness, and gnawing pains at the stomach. He had not since the 26th, suffered either from sickness or spasm, and expressed a firm persuasion, that the powders would intirely remove all his complaints. They were ordered to be repeated, and a few grains of rhubarb with myrrh, to be taken at bed time. The patient persisted in the above plan, with little

little variation, until the 10th of January, at which period his stomach had so far regained its healthy functions, that digestion was completed without any recurrence of spasm, flatulence, or acidity. He was then ordered a slight preparation of bark and bitters, and finally discharged cured, on the 21st,

Case III.

Mr. P. Æt. 36. of a spare figure, and melancholic temperament, had been long afflicted with dyspepsia, which was supposed to be connected with anomalous gout. He had been formerly addicted to the use of spirits, but his mode of life, for some time past, has been regular and sober. He complained of a fixed tormenting pain at the pit of the stomach, which gradually descended to the navel, where it generally terminated. The spasms came on at irregular periods, but for the most part attacked him after eating, and were usually relieved by the stomach rejecting its contents, in a state of remarkable acidity. The bowels were irregular, but more costive than lax. The evacuations were clay-coloured, and of due configuration. The urine small in quantity, and of a deep yellow. He complained of a strong pulsation at the region of the navel,

navel, which might be clearly distinguished by the hand, upon every deep and long continued respiration. The usual tribe of tonics, and antispasmodics, in a separate and combined state, had been in vain administered. Although the symptoms induced me to believe, that there existed some incurable organic affection in the stomach, or small intestines, and that the liver itself was also in a diseased state; I recommended the exhibition of the Oxyde of Bismuth*, as most likely to alleviate the spasmodic affection, and to prevent the formation of acid in the stomach. These purposes it effectually answered. He began April 2nd. 1806, with half a drachm of Pulv. Bismuthi Comp. three times a-day, and gradually increased the dose to two scruples. In a week, the spasms were subdued, the general dyspeptic symptoms considerably relieved, and the patient appeared to be gaining health and strength. This truce, from extreme suffering, continued for three weeks;

* I was farther encouraged to try this remedy in the present instance, from Murray's statement in his "Apparatus Medicaminum" (Vol. VI. p. 252.) when treating of Bismuth, "Dolorum quos schirrus pylorum obsidens excitaverit atrocissimorum insigne crebo, abejus usu lenimen comperit, *Dr. Odier.*"

when he was suddenly attacked, after an imprudent exposure to cold, with Hepatitis. From this alarming seizure he recovered, but only to linger out a few weeks in a hopeless condition.

The body was opened by my friend Mr. Killer, Surgeon, and my suspicions of an organic affection of the stomach, proved to be well founded. For the pylorus was discovered to be in a completely indurated and schirrous state, forming a hard, fleshy, and somewhat globular tumor, of at least four inches in circumference, but with little, if any constriction at its orifice. The liver was covered with broad and white specks, and appeared much enlarged. From the above statement, it may readily be conceived, that nothing beyond a palliation of the more urgent symptoms could have been expected from medicine. The Oxyd of Bismuth answered this purpose, probably by diminishing the irritability of the stomach, and increasing its tone, and thereby correcting a depraved secretion, and mitigating spasm.

A practical inference of some importance may be derived from the appearances discovered by the above dissection, and although foreign to my immediate subject, I shall venture

venture to state it. The absence of a due configuration and consistence in the alvine discharges, as well as their paucity, have been considered by many practitioners among the *diagnostic* symptoms of a schirrous state of the pylorus. For the disease has been often attended with such a degree of constriction of the lower orifice of the stomach, as to prevent any but a minute portion of liquid nourishment, and that in a very attenuated state, from passing into the intestines; and consequently under such circumstances, the formation of solid and regular fæces could not be expected. But it is clearly manifest, from the appearances which have been described, that an extreme degree of schirrosity may exist, with very little diminution of the aperture of the pylorus; and therefore, when this happens, there is nothing to prevent the fæces from exhibiting their accustomed configuration and consistence. Not long since a similar case occurred in this neighbourhood, where from the quantity and solidity of the fæces, the disease was not suspected to arise from a schirrous state of the pylorus, but merely from a loss of tone in the stomach, and a favorable prognosis was accordingly formed. The disease, however, terminated

fatally, and upon inspecting the body, the pylorus was found to be schirrous; but the orifice, although contracted, was sufficiently open to admit the passage of the food into the duodenum.

Case IV.

Philip Regan, Æt. 23,

Admitted Out-Patient, February 11th, 1806.

He has labored under Pyrosis for more than a year, and of late has suffered much from Gastrodynia. He has been a dram-drinker, but not to any great excess. His complaint is so constant and severe, as to prevent him from following his occupation, as a weaver. The pain is fixed and dull, and not of the spasmodic kind; but the quantity of acid discharged from the stomach, in a watery form, is more abundant than in the former cases. After clearing the stomach with an active emetic, the bowels were emptied by castor oil; and the patient then entered upon a trial of the Bismuth. He took twenty grains of the compound powder thrice a-day, for the space of a week, and then increased the dose gradually to forty grains. The gastrodynia was relieved after a few doses had been taken, and upon the 20th, the patient reported himself

self free from Pyrosis, and every other troublesome symptom. The Bismuth was ordered to be discontinued, and the bark, with vitriolic acid, to be substituted, which in a short time completed his cure.

Case V.

Richard Drane, Æt. 55,

April 15, 1806.

Applied for relief as an out-patient. He was subject to colicky pains in the bowels for many years past, which he justly attributed to his occupation as a house-painter. Since he changed his employment, the stomach has been the principal seat of disease. He is seized every day after dinner with excruciating pains in that organ, which continue for half an hour, and then only terminate by the contents of the stomach being thrown up in an undigested state. He has lost flesh, is much reduced in strength, and has a cadaverous aspect. There is no tendency to partial paralysis in any of the muscles, nor either pain or swelling in the membranes or joints, as occur in those instances where the poison of lead has pervaded the system. I considered, however, the spasmodic and debilitated state of the stomach, to have arisen from the former effects of

of this deleterious mineral. After duly evacuating the *primæ viæ*. I prescribed the compound powder of Bismuth, to the amount of half a drachm three times a day; and a blister was applied to the region of the stomach. On the 18th, he had taken nine powders, and found great relief from the pain, and sickness at his stomach. His vomiting had only returned once, and what was rejected had lost much of its unpleasant taste, and appeared to have undergone, in part, the process of digestion. By the 24th, the spasms were completely removed, and in the course of another fortnight, *without the aid of any other medicine,* he was discharged, entirely cured.

Case VI.

Hugh Mc Guinnis, Æt. 28. *Weaver.*

August 18*th,* 1806.

On account of the length and severity of this patient's disorder, he was admitted *into the Infirmary.* His chief complaint arises from a heavy pressing pain at his stomach, attended with a sense of constriction of the œsophagus, and eructations of an acid taste, and flavor, chiefly after meals. Sometimes the matter brought up is so intensely acid, as to

to blister the palate and lips. He is frequently awakened in the night, with a spasmodic affection of the stomach, accompanied with a violent pulsation about the umbilical region. The animal functions are considerably deranged. He makes water with difficulty at times; and his bowels are alternately loose and costive. His appetite is uncertain, sometimes decayed, and sometimes greedy; but even its moderate gratification, is sure to be attended with an increase of pain and sickness. His sleep is disturbed and unrefreshing, and his countenance betrays great mental anxiety, as well as bodily suffering. His complaint had existed for two years, and has greatly reduced the patient's bulk and strength. He had been accustomed to live chiefly on vegetable food of an acid and flatulent kind, and sometimes had indulged to excess in spirituous liquors. From the nature and duration of the disease, I was apprehensive there might be an organic affection of the stomach, and therefore my hopes of success were not sanguine. But as much uncertainty prevailed, and as my former experience had convinced me, of the utility of Bismuth in combating symptoms nearly allied to those which affected this patient, I resolved to give

it

it a trial. He was accordingly ordered to take, after the bowels had been properly cleansed, half a drachm of the compound powder of Bismuth, thrice a-day, and to have a small blister applied to the region of the stomach. His diet to consist chiefly of animal food, and broth; and for common drink, a small portion of ardent spirit, plentifully diluted with water.

24th.

The patient has already obtained great relief. The stomach is able to sustain a moderate portion of food without great uneasiness, and no longer rejects its contents in an acid state. The spasms are abated in frequency and duration, and the patient can now sleep uninterruptedly for several hours in the night. The pulsation at the navel continues troublesome, and the appetite is uniformly sickly, and languid. An infusion of bark with colomba, was directed to be taken after each dose of the powders.

27th.

The patient's appetite and strength are much invigorated; but he is still harrassed by the dull and pressing pain at his stomach, and sense of constriction at the œsophagus. A blister

blister was ordered to be applied to the epigastric region, and his medicines to be continued.

September 2nd.

The tone of the stomach is now completely restored, and indeed, there is but little derangement in any of the animal functions. The bowels have become rather torpid, and require castor oil to promote their regular action. The medicines were persevered in till the 9th, when the patient was suddenly seized with an acute pain in the umbilical region, attended with an increase of the pulsatory sensation, which he has so often experienced in the same parts. The attack was preceded by rigors, and accompanied with a strong, full pulse, and feverish heat. I ordered about eight ounces of blood to be taken from the arm, the bowels, which were rather constipated, to be freely evacuated, and his medicines to be discontinued for the present. The paroxysm terminated in a few hours, and the patient was able next day to resume his former plan, which he continued till the 15th, when he was discharged, completely cured.

REMARKS.

The foregoing statement of facts amply confirms Dr. Marcet's testimony, concerning the

the efficacy of Bismuth, in such affections of the stomach as seem to arise from morbid irritability, and loss of tone in that organ. The cases now before the public, are sufficiently numerous to warrant positive conclusions in favor of the remedy, as possessing tonic, antizymic, and antispasmodic powers. In Gastrodynia, Pyrosis, Cardialgia, and other local affections of the stomach, either accompanied with, or free from spasm, the Oxyd of Bismuth seems to be well calculated to afford relief. With respect to the nature of its precise mode of operation, I feel incompetent to offer a decisive opinion. From the alledged want of* success with the Oxyd of Bismuth, in diseases which depend upon general nervous irritation and debility, and which seem to arise from a peculiar morbid condition of the brain: such as Epilepsy, Chorea, Convulsions, &c. it would appear, that this remedy does not possess general tonic and antispasmodic powers in an equal degree with several other metallic oxyds. It therefore probably exerts, in such cases as have been described, a local and specific action upon the organs of digestion; and it is only by the restoration of the

"* In epilepsia tamen aut Convulsionibus solum nihil effecit." *Vide* Apparat: Medicamin: prius citat.

stomach

stomach to a state of vigor, and consequent healthy secretion, that the symptoms of acidity, spasm, and pain, can be effectually removed.

It may be proper to mention, that the Oxyd of Bismuth is justly intitled to the attention of practitioners, on the ground of *safety*, as well as utility. For in no one instance did I find it prove injurious to the stomach or general system; nor as a medicine was it disgusting to the palate.

Since the above reports were sent to the press, I have treated five cases of Pyrosis, accompanied more or less, with spasmodic pains of the stomach, with an uniform success. In all these Instances the Bismuth (with occasional aperients) was solely employed.

ADVERTISEMENT.

ADVERTISEMENT.

THE Author has been induced, by the Recommendation of some esteemed Medical Friends (especially the late Dr. Percival, and Dr. Currie) to re-publish the following Case of Hydrophobia, with additional *Remarks. He trusts the Singularity of the Case, and the Epitome from various Writers of the most remarkable Facts and Observations, relating to the Two Species of Hydrophobia, together with the additional Remarks on the Scheme for cutting off the Source of Canine Madness, (to which may be added, the Circumstance of the First Publication, appearing in a * Volume of Miscellaneous Literature) will sufficiently justify him for acceeding to the Wishes of his Friends, in annexing the Whole to a Work solely addressed to the Medical Faculty.*

Manchester,
January 18*th.* 1807.

* Memoirs of the Literary and Philosophical Society of Manchester, Vol. IV. 1793.

MISCELLANEOUS OBSERVATIONS

ON

CANINE AND SPONTANEOUS HYDROPHOBIA,

TO WHICH IS PREFIXED,

The History of a Case of Hydrophobia, occurring Twelve Years after the Bite of a supposed Mad Dog.

TO add another instance of the want of success in the treatment of Hydrophobia, to the melancholy histories already published, may appear superfluous and uninstructive. Yet, when we consider the peculiar fatality of this disease—the obscurity of its proximate, and, even, sometimes of its occasional cause —and, how few opportunities are afforded of minutely attending to its preceding and attendant phænomena, there may be some reason to imagine, that every faithful description of facts will be productive of advantage; and may probably at length lead to the establishment of a just theory, and a successful mode of cure. The following case has a peculiar claim to attention, on account of the great distance of time, from the bite of a supposed rabid animal, to the appearance of the disease. It is, indeed, a difficult task, to ascertain a fact

fact of this nature; and especially, when enquiries are to be made from ignorant and prejudiced persons. As it is, however, a matter of the utmost importance to be established, no pains have been spared, to gain every intelligence, which the Patient and his friends were capable of communicating. The result of the enquiry is in favor of the Patient's repeated assertion: "That he had never suffered the least injury, from any animal; except the bite, inflicted twelve years since, by an apparent mad-dog*."

John Lindsay, weaver at Fearn Gore near Bury, in the county of Lancaster, aged thirty-

* The Patient had lived at the village of Ashworth, near Bury, from the period of the bite, till within two months of his death, when he removed to Fearn Gore, in the same neighbourhood. An enquiry was made in every family, at both places, relative to there having been any mad animal in their neighbourhood, during Lindsay's residence among them; and, if so, whether they had ever heard, or suspected, that he had been bitten, or otherwise exposed to the danger of infection. They all agreed in returning a negative answer to both these questions. I ought further to observe, that as both these villages contain few families, and these, without one exception, having dwelt in the same place, from the time of the Patient's coming among them, to the attack of his complaint, their evidence in support of the Patient's declaration, is complete and satisfactory.

six,

six, of middling stature, and spare habit of body, and of a temperament inclined to the melancholic, was brought into the Manchester Lunatic Hospital, on Friday May the sixteenth, 1794, about three o'clock in the afternoon. He was immediately visited by Dr. Le Sassier, who obligingly communicated to me the following particulars. The Patient expressed feelingly his sense of danger, from the persuasion that his disorder proceeded from the bite of a mad dog. He was desired to drink a little cold water, which on being presented to him he rejected, with every appearance of disgust and horror. Being again strongly urged to drink, he made the attempt, and with great exertion got down a small quantity of the liquid. He was perfectly rational, but appeared apprehensive of danger from the least noise, or approach of any person towards him. He expressed a desire to make water, and was quitting the room for that purpose; but no sooner had he approached the door, than he suddenly retreated, complaining of an unpleasant sensation he felt from the cold air, and particularly that it produced a convulsive twitching, about his throat. To screen him from the effects of the air, when conveyed from the examining room into the Hospital,

Hospital, an umbrella was held over his head, and his body closely muffled up in a wrapping cloak. As soon as he had got into his apartment, he ate some bread and cheese, but with difficulty; and requested to be allowed to drink some butter-milk. He attempted to swallow this liquid, and in part succeeded; but not without the most violent struggling efforts, attended with distortions of his countenance, which remained slightly convulsed for some time afterwards.

A consultation of the Physicians of the Hospital being called by Dr. Le Sassier, and the assistance of Dr. Percival, Physician extraordinary to the charity, requested; the latter Gentleman, in concurrence with Dr. Le Sassier, (the rest of the Faculty being out of the way) entertained not the least doubt of this Patient being afflicted with genuine Hydrophobia. As the disorder was far advanced, and might, indeed, be considered as nearly terminating, being the third day from the appearance of the symptom of Hydrophobia, little or no advantage could be expected from medicine. He was ordered, however, about four o'clock the same afternoon, to take a bolus composed of twelve grains of musk, two grains of opium, and six grains of camphor, Two drachms of strong

strong mercurial ointment were also directed to be rubbed in, upon the throat and breast. I saw the Patient, in company with the other Physicians, about six o'clock the same evening; and we found him very willing, and sufficiently composed, to give a distinct account of the circumstances preceding the disease, and to describe his sufferings since its attack. The following particulars were collected. He has been industrious, sober, and regular in his mode of living; but subject to low spirits from the difficulty he found, at times, of maintaining a wife and six young children. His exertions, however, were in general proportionate to his difficulties. But of late, from the depreciation of labor, he found, that the most rigid œconomy and indefatigable industry were not sufficient to ward off, from himself and family, the calamities of hunger, debt, and most abject poverty. The anxiety of his mind now became almost insupportable. As the last refuge for his distress, he applied, a few days previous to the attack of his complaint, to the Overseers of his Parish for their assistance to pay his rent, and thereby prevent the seizure of his goods; but obtained no relief. Overwhelmed with grief and disappointment, he yielded to despair, resigning himself

self and family to their wretched fate. He was soon roused from this state of fancied apathy, by the piercing cries of his children demanding bread. In a paroxysm of rage and tenderness, he sat down to his loom on the Monday morning, and worked night and day, seldom quitting his seat, till early on the ensuing Wednesday morning. During this period of bodily fatigue and mental anxiety, he was entirely supported by hasty draughts of cold buttermilk, sparingly taken. Nor did he quit the loom, until his strength was completely exhausted. He then threw himself upon his bed, and slept a few hours. On waking, he complained of giddiness and confusion in his head, and a general sense of weariness over his body. He walked five miles that morning, in order to receive his wages, for the completion of his work; and, on his return, felt much fatigued, and troubled with a pain in his head. During the night, his sleep was interrupted by involuntary and deep sighs—slight twitchings in the arms—and a sense of weight and constriction at the breast. He complained of much uneasiness at the light of a candle, that was burning in the room. On evacuating his urine, he was obliged to turn aside his head from the vessel,

vessel, as he could not bear the sight of the fluid without great uneasiness. Being rather thirsty, he wished for balm tea to drink; but was unable to swallow it from a sense of pain and tightness, which he experienced about the throat, when the liquid was presented to him. He suddenly exclaimed, on perceiving this last symptom, "Good God! It is all over with me!" and immediately recalled to his Wife's recollection, the circumstance of his having been bitten *, twelve years ago, by a large dog apparently mad; which was flying from the pursuit of a number of people, on the high road between Warrington and Manchester.

During the whole of Thursday, his abhorrence of fluids increased; and he now began to feel an uneasy sensation on being exposed to the air. The slight twitchings of his arms were also increased to sudden start-

* Soon after this accident, he applied to a Surgeon at Ashton in this neighbourhood, who dressed the wound for a short time, and ordered the Ormskirk medicine to be taken. The wound was speedily healed: and the Patient had never distrusted his being cured, till the moment he was unable to swallow liquids. I wrote to the Surgeon, with a view of obtaining particular information relative to the state of the wound, &c. but, the circumstances had altogether escaped his memory.

ings; attended with a violent agitation of his whole body. He had suffered much from his journey, being brought eight miles in an open cart. I perceived at this time (half past six, Friday evening) that his countenance expressed the utmost anxiety; his breathing was laborious and interrupted; and he complained of a dull pain, shooting from the arms towards the præcordia and region of the stomach. A livid paleness overspread his face; the features were much contracted; and the temples moistened with a clammy sweat. He suffered greatly from excessive thirst, and dryness of the mouth and fauces *.

An unusual flow of viscid saliva occasioned him to spit out frequently. He complained of a remarkably fetid taste in his mouth, and a loathsome smell in his nostrils. He ate some bread and butter, at his own request, but with great difficulty, as he was obliged to throw his head backward, in order to favor the

* We now examined the part that had been bitten, and discovered a slight *cicatrix*, almost obliterated, upon the origin of the *Tendo Achillis* of the left leg. He had never suffered any pain, nor complained of the slightest uneasiness. in that or the neighbouring parts, since the wound healed. No alteration in the color of the skin was perceptible.

descent

descent of the morsel down the gullet. He was requested to wash down this solid food, with some liquid; and he expressed a readiness to make the trial. On receiving a bason of buttermilk, he hastily applied it, with a determined countenance, to his lips; when he was instantly seized with so severe a spasm and rigidity of the muscles of the neck, that he was compelled, in an agony, to desist from drinking. Shortly after, he raised himself upon his knees in bed, took the bowl again into his hands, and by forcibly stretching his neck forward, at the moment he received the liquid into his mouth, and then violently throwing his head backwards, he succeeded in swallowing a small portion. He appeared highly gratified with the success of this effort, and the fortitude he had exhibited; and exultingly demanded another draught of the buttermilk, as he now thought he could conquer the difficulty he had hitherto experienced. But a violent return of the spasms in the throat and neck checked this attempt. These convulsions were terminated by the stomach discharging the liquid previously swallowed, highly tinged with bile. I perceived that he had conveyed a piece of orange, under the bed cloaths, which at intervals he applied to his

his mouth by stealth, and as it were unperceived by himself; for he constantly hurried it to his lips, when his attention appeared to be engaged on other objects. This stratagem did not succeed. No sooner had the morsel touched his mouth, than he was seized with convulsions about the throat, and a stricture at the breast. I saw him again, in consultation, at eight o'clock this evening. He had taken two doses of the bolus; and the ointment had been carefully rubbed in. He appeared rather more composed, but expressed great anxiety at the idea of being left alone. He courted eagerly the conversation of those around him; apparently from the motive of withdrawing his mind from the contemplation of his miserable state. The repugnance he felt at swallowing liquids, and the uneasiness occasioned by the attempt, he now considered as his chief complaints; and was determined to conquer the first by perseverance, and an undaunted resolution. His spasms seemed to be somewhat mitigated, as he got down a little milk-porridge with less difficulty than usual. A repetition of his medicines every three hours, was ordered during the night. At nine o'clock the next morning (Saturday) he was visited again; and

and we learned that he had passed the night without a moment's rest, frequently shouting out with looks of horror, and sometimes wailing in broken and confused murmurs; but, on being spoken to, he always returned rational answers. He was now alarmed to a degree of distraction at being left alone. He examined every object with a timid and suspicious eye; and, upon the least noise of a footstep in the gallery, he begged, in the most piteous accents, to be protected from harm. He had never offered the least violence to any one, since the commencement of the disease; and, even now, when the encreased secretion of saliva occasioned him to spit out very frequently, he apologized to the bystanders, and always desired them to move out of the way. I observed, he frequently fixed his eyes, with horror and affright, on some ideal object; and then, with a sudden and violent motion, buried his head underneath the bed-cloaths. The last time I saw him repeat this action, I was induced to enquire into the cause of his terror.—He eagerly asked, if I had not heard howlings and scratchings? On being answered in the negative, he suddenly threw himself upon his knees, extending his arms in a defensive posture, and forcibly

forcibly throwing back his head and body. The muscles of the face were agitated by various spasmodic contortions;—his eye balls glared, and seemed ready to start from their sockets;—and at that moment, when crying out in an agonizing tone:—"Do you not see that black dog?" his countenance and attitude exhibited the most dreadful picture of complicated horror, distress and rage, that words can describe, or imagination paint!—The irritability of the whole system was now become excessive. He discovered the highest degree of impatience on the least motion of the air. Every action was accompanied with that hurry and inquietude, which marks an apprehension of danger from surrounding objects. The oppression of the præcordia was evidently encreased; and, when he gasped for breath, the whole body was writhed with convulsions. His speech was interrupted by convulsive sobs. The pulse was tremulous and intermitting; and, at some times, so hurried as not to be counted. He had frequent retchings, and brought up occasionally small quantities of a yellow liquid. Solids were now swallowed with excessive difficulty; and the attempt always produced strong spasms about the neck and breast. At ten o'clock (the same morning)

ing) we met in consultation; when the medicines were ordered to be repeated every two hours, with an increase of the dose of opium, from two to three grains. Half an ounce of strong mercurial ointment was ordered to be rubbed in, over the surface of the body, and a sponge dipped in vinegar to be constantly held to the mouth and nostrils. At four o'clock the same day, the consultation was renewed. We found the patient had been able to swallow his boluses without much difficulty, and had drank several times with infinitely more ease than usual; but, the fluid had been immediately rejected by the stomach, and had come up, deeply tinged with yellow. His countenance exhibited a cadaverous aspect. His voice was hoarse, indistinct, and faltering. He complained of a fixed pain at the region of the stomach; which he had felt, more or less, during the disease. The pulse was feeble, and scarcely perceptible. He swallowed some tea with less difficulty, than had been observed since his entrance into the Hospital. His dissolution was apparently drawing near: yet, it was deemed advisable to order his body to be rubbed with warm oil; and one ounce of that fluid to be taken every half hour, or as often as the stomach would bear it. His mental

mental faculties at this period suffered very little derangement; for although, when not attending to external objects, he would utter some incoherent sentences; yet, the moment he was spoken to, he was perfectly collected, and returned rational answers. At half past four o'clock, he submitted willingly to have his body rubbed with the oil, and for that purpose sat down upon the side of the bed; when he was seized with an instantaneous convulsion, threw himself backward—and expired without a groan! An immediate inspection of the body would have been a desirable circumstance: but we were obliged, (however reluctantly) from unavoidable impediments, to defer the dissection till the following morning. Accordingly, on Sunday morning, about ten o'clock, the body was opened in the presence of one of the Physicians, myself, and two of the Surgeons belonging to the charity. I have to regret that the examination did not extend to the brain; and indeed, that a more minute investigation of the morbid appearances, accompanying this fatal malady, did not take place. But, such was the peculiar horror inspired by a view of the progress and catastrophe of the disease, that the accustomary dread of danger arising from any examination

tion of an hydrophobic subject, was increased in this instance, to a tenfold degree. Besides, the well known prejudices entertained by the country people, against the opening of dead bodies, rendered us anxious to finish the inspection before the arrival of the patient's friends, who were hourly expected. In the cavity of the thorax no unusual appearances were discovered; except, that the surface of the lungs appeared of a darker hue, and more distended with blood than usual. No inflammation appeared on an inspection of the fauces; nor were the muscles of the Larynx or Pharynx in the least discoloured. The stomach and Œsophagus were removed from the body, and subjected to particular inspection. A longitudinal incision was made through the whole cavity of the Œsophagus, but not the least marks of disease were discovered. Upon opening the stomach, evident traces of inflammation were observed. It commenced at the superior orifice, and was there confined to small and irregular spots of a dark red color; and might also be traced in a linear form, and of a brighter red, along the curvature of the stomach, terminating at the pylorus in large and irregular spots of a gangrenous appearance. The contents of the stomach

stomach did not exceed three ounces; and consisted, chiefly, of the medicines that had been swallowed, mixed with a dark coloured fluid. All the other viscera of the abdomen exhibited no marks of disease.

The novelty and importance of the case above related, will, I trust, sufficiently apologize for the following enquiry. That it exhibits the genuine symptoms of RABIES CANINA, will not be doubted by those, who have had opportunities of seeing the malady, or have consulted the best authorities on the subject. The dread of liquids; the peculiar and distressing anxiety about the præcordia; and the morbid irritability of the nervous system, which were all experienced by this patient, leave no room for doubt concerning the resemblance of the disease to that which is the offspring of the canine poison. When we reflect on the length of the interval, from the infliction of the bite of a supposed rabid animal to the appearance of this disease, an important question naturally arises:—Are we to consider this case as arising from the influence of the canine poison; or as an instance of what authors have termed spontaneous Hydrophobia? A variety of cases, related by different writers, seem to prove the existence

of

of Hydrophobia, unconnected with the bite, or agency of the poison, of any rabid animal. The generality of systematic authors mention the occurrence of canine madness at the distance of many years from the application of the poison of a distempered animal. It has, also, been asserted, that the contact of the saliva of a mad animal with the body is capable of producing Hydrophobia. Indeed, some authors have gone so far as to maintain, that the volatile parts of the saliva, being carried off with the breath of a rabid animal, have been capable of producing the disease, when received into the stomach or lungs of any person.

I am fully sensible of the caution to be observed, in drawing positive inferences from the generality of medical histories on this subject:—For an attachment to the marvellous; a blind obedience to authority; and a rage for hypothesis seem to have possessed the ancient systematic writers, who have treated on this malady. In order, therefore, to appretiate the credit due to these various histories, and to the opinions derived from them, I shall only cite the most respectable authorities; and, indeed, chiefly confine my attention to those cases, which have been subjected to the inspection

spection of their respective relaters. I proceed, therefore, to consider, first, the histories and facts that have been adduced in favor of the opinion, that the canine poison has lain dormant for a great length of time, and afterwards been excited into action: Secondly, those cases, which have been attributed to the contact of the saliva of a rabid animal with the surface of the skin; or to its application, internally as well as externally, by any other mode than the intervention of a bite: Thirdly, such instances of the disease, as have been said to have arisen spontaneously, or *, at least, whose origin could not be traced to a bite, or any other mode of infection, from a rabid animal.

I. It

* I have adopted the term "Spontaneous Hydrophobia," in conformity with the usage of the generality of medical writers. But I wish it to be understood in a sense different from that, in which it is commonly used. For, notwithstanding all the usual symptoms of canine madness have arisen in many cases, without the intervention of the poison of a rabid animal, I do not conceive, in such instances, any specific poison to have been generated in the habit.—The canine virus operates, not only as a stimulus on the nerves, but also appears to produce a specific action in the salivary glands, and thereby effects a change in their secretions: at least, this change takes place in the canine race.—But, there

is

I. It is difficult to ascertain any precise period for the appearance of this disease, after

is no proof of such an assimilation of the saliva occurring in any instance of Hydrophobia, arising spontaneously, or excited by any other cause than that of the poison of a mad animal. Therefore, as we know that a variety of stimulant powers are capable of producing effects analogous to those excited by the canine virus, it is more consistent with the rules of just induction, to attribute the symptoms of spontaneous Hydrophobia to the operation of these powers, than to have recourse to a vague conjectural idea of their being produced by a specific poison, generated in the body. Nosologists have considered spontaneous Hydrophobia, as a *species* of the *Genus* HYDROPHOBIA; but their definitions are inaccurate—It is the HYDROPHOBIA *simplex* of Dr. Cullen, and is defined: "HYDROPHOBIA *(simplex)* sine rabie vel mordendi cupiditate," in contradistinction to the first species, which he describes to be: "HYDROPHOBIA *(rabiosa)* cum mordendi cupiditate, ex morsu animalis rabidi." The second species of Cullen corresponds with the HYDROPHOBIA *spontanea* of Sauvages, as his first agrees with the HYDROPHOBIA *vulgaris* of the same author. These definitions do not rest upon facts. For, so far is the "cupiditas mordendi" from being an essential symptom in the HYDROPHOBIA *rabiosa*, that it very rarely occurs in that disease.—On the contrary, this symptom has taken place in several cases of the HYDROPHOBIA *simplex* or spontaneous Hydrophobia, related in the course of this enquiry; but, it by no means seems to be an essential symptom of the disease, in either species.

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the communication of the poison. From forty days to three months, may, perhaps, be considered, taking modern writers for our guides, as the average distance of time.—But the interval of the appearance of the disease from its supposed cause, according to some writers, is so indeterminate, as to include a period of time, from one day*, to forty years†. There are, however, several well authenticated cases, in which the disease occurred at the distance of six months, one year, and even a longer period, from the communication of the virus. In the *Act. Norimberg* ‡, a well marked case of canine madness is described of a gardener, who was bitten September the 25th. 1720, and died, Hydrophobic, on the 8th. of May, 1721.—Another indisputable case is recorded, in the same work, of a patient who fell a victim to the malady nearly a year from the date of the infection. In the *Ephemerides N. C.* § the history of a young woman, bitten by a rabid animal, is detailed; in which it appears, that

* Medical Comment, Vol. V. p. 304.

† Morgagni, de Caussis et Sed. Morbor. Epist. viii. Art. 21:

‡ Observ. 7. Vol. I.

§ Ann. 7mo. Obs. 148.

the

the poison lurked dormant for the space of one year, and then proved fatal.

Galen * asserts from his own knowledge, that the disease in one instance did not appear till after the space of a year, from the communication of the poison. Actuarius † affords a similar proof of the disease occurring six months, and even, one year, from the date of the bite. Dioscorides ‡ has observed, that although the disease, for the most part, discovers itself in forty days after the infection; yet, in some instances, six months, and even a year have intervened. Though we may be fully warranted to conclude, from the testimony of the above authorities, to which many later examples might have been added, that the symptoms of canine madness have not been manifested till so long a period as twelve months after the infliction of the bite; yet we

* "Novi sane & quendam, qui, exacto anno, in eum incursit affectum, quem Hydrophobiam vocant."

GALEN. *lib. Prorrhet. sect* 2. *com.* 17.

† "Attamen post sex menses, & anno elapso, invadere contigit, ut nos ex *experientiâ* comperimus."

ACTUAR. *Method. Medendi. Lib.* viii.

‡ "Cum enim ut plurimum ad quadragesimum usque diem differri consueverit; neglectis tamen quibusdam, post semestre, imo etiam post annum, supervenisse observabimus." DIOSCORID. Lib. vi. *Cap.* 3.

can place little dependance on the testimony of many authors, who have endeavoured to prove the occurrence of this disease, at the distance of five, seven, and, even twelve years, from the communication of the poison. Salius *, who ransacked all the writers of antiquity on this subject, has brought forward a variety of instances to prove the existence of these facts. But we shall find, that Salius has been contented to rely on very slender evidence, for the proof of his assertions. For instance: he quotes the authority of Dioscorides as certifying the appearance of canine madness, after an interval of seven years from the infection; yet, what does this testimony of † Dioscorides amount to? To nothing decisive: for, it goes no farther than to observe, that *some writers* have related seven years to have elapsed from the communication of the poison to the appearance of the disease. Schenkius, Zacutus, Guinerius, Platerus, &c.

* "Hinc aliqui ad dies plures, alii ad menses, aliqui anno exacto, rabie corripiuntur; in nonnullisque proditum memoriæ ab antiquis habemus—hunc morbum ad quintum, septimum, & duodecimum annum, dilatum fuisse." SALIUS *de affect. partic.* p. 360.

† "Sunt, qui *narrent*, nonnullos post septennium, eo affectu, correptos fuisse." *Lib.* vi. *Cap.* 8.

and

and, almost all the systematic writers of the 16th. and 17th. centuries, have imitated the conduct of Salius. The Arabians furnished them with some authorities, which may generally be traced to the Grecian writers; and these, for the most part, relied on hear-say testimony, or, the inaccurate histories of supposed cases of Rabies Canina. Albertus Magnus * speaks positively, indeed, of a case, that fell under his own observation, in which the disease appeared after an interval of seven years from the bite of a rabid dog. Guinerius † has, likewise, pledged the authority of a friend; whom he esteemed worthy of credit, for the occurrence of Rabies Canina, eighteen years after the patient had been bitten by a mad dog. The disease proved fatal on the third day. Salmuth ‡, after quoting from various writers several instances of Hydrophobia taking place at the period of eighteen or

* "Vidi hominem morsum a cane rabido in brachio, & anno septimo post incepit inflari locus cicatricis, & mortuus est infra duos dies."

ALBERT. MAG. *de Histor. Animal. Lib.* xvii.

† "Quod cuidam, post decimum octavum annum a cane rabido morso, metus aquæ accesserit."

Tract. de Venenis.

‡ SALMUTH. *Cent.* 1. *Obs.* 96.

nineteen years after the bite, relates one case, from his own authority, in which the symptoms occurred several years after the patient had been bitten by her husband, who died of Hydrophobia.—Among later writers on this subject, the same habit of indiscriminate quotation and easy credulity may be observed. Even the accurate Morgagni *, when treating on this subject, does not form an exception to the charge. He has quoted an authority from the German Ephemerides †, to support his assertion, that the canine poison has lain dormant for twenty years, and then proved fatal. On consulting the original it appears, that Morgagni either never read the case, but took it upon loose authority; or has drawn false conclusions from a statement of the facts. For the writer of this case relates, that his patient had been several days afflicted with a malignant fever; and also complained of a pain in the fauces, which were inspected by a surgeon, and found inflamed ‡. Surely this last symptom, added to the great debility the

* *Epist. Anatom.* viii. *Art.* 21.

† *Ephem. N. C. Ann.* 9 & 10. *Obs.* 43.

‡ "Fauces erant siccissimæ, & tandem ob defectum humidi *inflammabantur;* malignitas indies crescebat; deliria accedebant, & octavo morbi die animam efflavit."

patient

patient labored under, sufficiently accounts for the aversion to swallow liquids, and the consequent disgust experienced at the bare mention of them; without recurring (with the Physician) to the idle story of the patient being bitten twenty years ago, by a dog supposed to be mad. In the other instance, of * forty years intervening between the bite and the disease, the authority which Morgagni has borrowed is extremely suspicious and unsatisfactory. Gaspar a Reies †, to whom he has referred, after collecting at random a number of marvellous cases from different authors, closes the list with a case on the authority of Alzaharavius, in which the interval of forty years took place from the date of the infection to the appearance of the disorder. It would, therefore, appear from this enquiry into the facts brought in support of the inactivity of the canine virus for so long a period, that these writers have either been mistaken in referring the origin of the disease to a supposed far distant cause, when the

* *Loc. prox. cit.*

* "Quod magis est, Alzaharavius, propria experientia testatur, venenum per quadraginta annos in corpore delituisse."

Elysium Jucundar. Question, Q. 61. N. 11.

actual

actual one had escaped observation, or that they erred from too readily adopting vague and hear-say testimony.

II. With respect to the influence of the canine virus in producing Hydrophobia, when applied merely to the surface of the body, I apprehend we must receive the various authorities, in favor of the fact, with some degree of caution. That the disease has occurred from the contact of the saliva of a rabid animal with the skin, independently of any bite, or the infliction of an apparent injury, I would not venture to deny: but that no imperceptible rasure of the skin by the teeth of the animal, or exposure of the true skin from a previous scratch—destruction of a pimple—or any accidental injury had not taken place, in most of these cases, I am rather inclined to doubt. In the German Ephemerides*, an instance is related of Hydrophobia occurring from the mere contact of the saliva of a mad animal, without the infliction of a bite †. Johan. Mathæus de

* Ann. 7. Ob. 121.

† "Non quidem commorsa, sed tantum saliva ex ore spumante hinc inde in corpore commaculata esset; octavo die, vehementi rabie correpta est, & tertia die placidè obiit."

Gradibus

Gradibus has furnished us with an instance of this disease, arising from a person applying his hand to the mouth of a mad dog. In this case*, though no bite was inflicted, yet the disease manifested itself at some distance afterwards. Matthiolus advises us not to treat with neglect the instances that have been adduced by various authors, of the production of Rabies Canina, by the mere contact of the saliva with the naked body. He strengthens this cautionary advice, by bringing forward his own* authority to prove the occurrence of the disease, from the mere aspersion of the saliva on the bodies of two of his patients. Fab. Hildanus, in a letter to his friend Doctor Abel Roscius of Lausanne, laments the incredulity of many persons, who had treated as fabulous the account he had given of a remarkable case of Hydrophobia, arising solely from a woman having applied her lips and tongue to that part of a garment which had been torn by a mad animal.

* "Johan. Coqueranus infectus fuit rabie post multos dies, *ex sola impositione manûs in os canis rabidi;* etsi eum canis non momorderit."

JOH. MATHOEI *Consul*, No. 82.

+ "Quippe quod duos ego viderim, qui *spumâ tantum*, nullo quidem ex morsu accepto vulnere, rabiem contraxerunt.". MATTHIOL. *Comment. lib.* 6.

In

In order, therefore, to banish the scruples of the most sceptical, he subjoins a * history of the case, and pledges his veracity for the truth of the relation. To render this narration the more probable, he adds two cases which fell under his inspection, the year following the above-mentioned event. The first is particularly deserving of attention, as it affords certain proof of the danger to be apprehended, if the slightest rasure of the skin be exposed to the action of the canine virus. It is the case of a young man, who received a scratch from a rabid cat, and that of so light a kind as scarcely to raise the Epidermis †. This accident happened the summer preceding that in which the disease occurred.—He died on the third day of the attack, under all the genuine symptoms of Hydrophobia.

* "Matronæ cuidam in via obviam canis rabiosus, qui vestem ejus dentibus arripiens, huc et illuc trahebat; donec tandem, veste laceratâ, *cute tanen mulieris illæsâ et intacta*, canis aufugit: illa, vero, nescia canem rabiosum fuisse laceratam vestem, *filo dentibus abscisso*, resarcire cœpit.—Tribus mensibus pòst, visionibus horribilibus et pavoribus agitari cœpit, et aquam et vinum odisse, et, quod pejus est instar canis latrare, dentibus domesticos arripere, &c."

FAB. HILDAN, *Cent.* 1. *Obs.* 86.

† *Obs.* 86.

It

It is probable in the present instance, that the claw of the animal was the medium by which the saliva was communicated to the injured cuticle. If this were the fact, how inconceivably virulent must be the action of this poison, when so small a portion as could be conveyed by such an instrument as the claw of a cat, was capable of producing the malady! —The second case referred to by Hildanus, arose from the slightest bite imaginable of a rabid animal. This accident proved fatal to the sufferer. The well-known history which * Cælius Aurelianus relates (founded on report only) of a woman suffering the baneful effects of the canine poison, from merely applying her tongue and lips to the infected threads of a garment, which had been torn by a mad dog, might justly have been considered unworthy of credit, had not the case of Hildanus, and a similar one mentioned by Doctor Hamilton†, served to corroborate the testimony of this author. Cardan has also recorded the circumstance of his being called in to assist at a consultation, in a case of Hydrophobia; and, on an enquiry being made into the cause of the malady, the by-standers con-

* *De morb. acut.* Lib. 3. Cap. 9.

† HAMILTON "*On Hydrophobia*," p. 22.

fessed,

fessed, that the patient had kissed a rabid dog, previous to its being hanged*. The patient died the following day, according to the prognostic of his Physicians. These instances are corroborated by the following case. It was communicated to me by Dr. Percival, and is supported by his own respectable authority. A man residing at Worral in Cheshire, during his being asleep and lying on the ground, was licked about the mouth by an infected dog; but suffered *no bite,* nor the *slightest apparent injury* of the skin. He was, however, seized about the usual period with symptoms of Hydrophobia; and died of the disease, notwithstanding the usual preventive means had been adopted previous to its attack. Aretæus † affirms, that the breath of a mad animal being taken into the lungs of any person by inspiration, will produce the disease. This may be considered, however, as a bare assertion, un-

* "Adstantes confessi osculasse rabidum canem antequam emitteret suffocandum:—Mortuus autem est sequente die, ut nos prædixeramus."

CARDAN, *Contradict.* 9. *Tract.* 5. *lib.* 2.

† "Quinetiam et a rabido cane, qui in faciem dum spiritus adducitur tantummodo inspiraverit, et nullo pacto momorderit, in rabiem humo agitur."

De causis et signis Morbor. Lib. 1.

supported

supported by any demonstration. Palmerius* has related the history of a whole family, who were infected from kissing their father, in compliance with his request, when just expiring of canine madnes †.

III.

* *De Morbis contagiosis*, p. 266.

† I conceive this extraordinary history (and one related by Salmuth) deserving of little credit. Palmerius and Salmuth are the only writers (that I am acquainted with) who have stated, *from their own knowledge*, that a bite from any person afflicted with canine madness, has been capable of communicating that disease to any of the human species:—An abundance of negative facts might be brought to contradict this statement. But, as no absolute conclusion can be derived from them, I would suggest the following reasons for rejecting the testimony of the above-mentioned writers. First—If the saliva of an infected human being were capable of producing canine madness in another of the same species, surely many instances of this kind must have occurred to the numerous writers on this subject; especially, when the chance of persons being exposed to the danger of such an accident is so great, that, from *two* cases only, which I have seen, *four* people were subjected to the danger of receiving the infection: two of them, by kissing the patient, and the rest, by having had the saliva in contact with fresh wounds in their hands. Yet they all escaped without using any preventive means. Secondly, Dr. Vaughan has failed in his experiment of returning the disease from the human species to the dog. He innoculated that animal with the saliva of a rabid person,

III. I come now to the consideration of the instances of spontaneous Hydrophobia. Its occasional causes are various; fright—sudden and violent affections of the mind—wounds received from enraged animals—the drinking of cold water, when the body has been previously heated—excessive fatigue in hot weather—have all been assigned by different writers, as the occasional causes of this complaint. Indeed, in some instances, it has been difficult, if not impossible, to trace its origin to any occasional cause. The following cases, carefully selected from a variety of more equivocal authority, will prove the efficiency of the above mentioned occasional causes in producing this disease; and also demonstrate, that it has sometimes occurred where no occasional cause has apparently preceded. The five cases recorded by Marcellus Donatus, and considered by Morgagni*, as affording certain proof of the existence of spontaneous Hydrophobia, are particularly intitled to attention. Unquestionably, Morgagni was

person, but without producing any effect. Thirdly, Salmuth and Palmerius are both fond of the marvellous; and their writings seem better calculated to excite surprize, than to convey information.

* *Epistol. Anatom.* 8. *Art.* 31, 32.

little

little scrupulous in misleading his readers, when he brought forward *all* these cases, as *equally* demonstrative of the existence of this malady. If he had examined them with his usual accuracy, he would have found no room to censure the scepticism of those, who differed with him in considering *them all* as undoubted instances of Spontaneous Hydrophobia. For, notwithstanding we might give credit to the relation of Donatus, so far as respects the absolute freedom from suspicion, in all these cases, of any infection having been communicated by a rabid animal; yet it does not follow that they ought to be considered as cases of Hydrophobia, unless their symptoms warrant such an inference. In the first case*, the complaint appears to have arisen either from a laceration, or spasm of the Œsophagus; or a Paralysis of the muscles of the Pharynx. The patient was seized suddenly at dinner, with a violent pain and constriction in and about the throat, which he attempted to remove by drinking some liquor, but found himself unable to swallow it. He remained incapable of either eating or drinking till the next day, when he swallowed some grapes, but would not be persuaded to at-

* MARCEL. DONAT. *Lib.* 6. p. 96 et 294.

tempt

tempt to get down any liquid. He died the same evening.

2d. A woman was seized with a pain in her arm, attended with a violent tremor of the whole body. On the third day the pain ceased, but the trembling continued. She experienced a sense of suffocation about the breast. If wine, water, or broth were presented to her, she fell into convulsions, and even faintings. She was able to swallow solids with perfect ease. The faculties of sense and reason remained unimpaired *. Her disposition was mild, and her conversation tranquil. She expired on the fifth day of the disease.

3d. A young woman was alarmed at seeing a combat with swords: she had all the violent symptoms of Hysteria, with the dread of liquids superadded. Indeed, the shock appears to have been so violent, as greatly to injure the sensorium; for she was highly delirious, intractable, and feverish. She died on the fifth day of the disease.

4th. A husbandman, 27 years of age, after his usual labor of the day, complained of a

* "Si vinum, aqua aut jusculum propinetur, convellitur et deficit: ova ac panem probe sumat: facultates principes ac sentientes valde constant," &c.

MARCEL. DONAT. *Lib.* vi,

pain

pain in his arm. On the eighth day of this complaint, he was seized with slight shiverings. He retired to rest on that evening, without having any inclination to eat. The family were alarmed in the night by his frequently uttering loud shouts, and at times requesting he might be restrained from injuring any one. His respiration was laborious and interrupted. Donatus being called in to his assistance, privately prognosticated, that the patient would refuse to drink; and if he attempted it, would not succeed; and also that his death was approaching. These events succeeded each other according to the prediction of the Physician; and the patient died in the space of four hours.

5th. A healthy and robust countryman, was attacked suddenly with sweatings and a constriction, attended with anxiety about the precordia *. The instant Marcellus Donatus saw the patient, he predicted, that he would neither swallow liquids, nor live many hours. The prognostic was speedily verified: for, when cold water was offered to the patient, he was seized with a sudden horror and fainting. The water being removed he presently recovered.

* "Cum angustiâ cordis et agonia."

vered *. He would by no means suffer any one to approach him; nor could he bear, without great emotion, the sweat to be rubbed from his face. If by accident the napkin fell upon his face, or pressed lightly upon it, he seemed extremely afflicted and irritated. He expired in a few hours. Marcellus Donatus affirms, that in all these cases the strictest enquiry was made, both from the sufferers and their friends, relative to the patients having ever been exposed to the influence of the canine poison; and that they assured him there was not the slightest suspicion of a circumstance of that kind ever having happened to any of them. Morgagni † cites the authority of Kochlerus for two cases of Hydrophobia, in which the disease arose from the patient's drinking cold water when violently heated. In the Journal de Medecine ‡, there are two instances recorded of Hydrophobia arising from excessive fatigue, by a long march in hot weather. Gui. Patin § has also noticed

* "Namque ægrotanti oblatam frigidam aquam, ipse repentè horrescit, et linquitur animo; eâ reductâ, actutùm reviviscit."

† Epist. prius cit. Art. 31.

‡ Tom. 7. Juillet. An. 1757. p. 3 & suiv. Tom. 8. Aöut. p. 81, p. 1757.

§ Tom. 1. p. 275. Tom. 3. 169

the

the occurrence of this disease from similar causes. The German Ephemerides * contain a singular case of Hydrophobia from the bite of an enraged dog. The case is related by the Physician who attended the patient. Jacob Otten, having chastised a dog which had devoured a favorite hen, was bitten by the animal in the wrist. He was visited by his Physician on the following morning. The patient complained of great stricture and anxiety about the breast; his countenance appeared stern and distressed; the tongue and throat were dry and parched, but not the slightest inflammation was visible in those parts. Although at first he was able to bear the sight of liquids, he now shuddered at them with extreme aversion. He declared some time after when pressed to drink, that he was not able, without feeling the most excruciating torments, to look upon, much less to swallow liquids. The wound had healed during the time he suffered these complaints. He died about the sixth day of the disease. The dog was not mad, as he was alive and well long after the patient died. Another case described in the same work †, by Doctor J. B. Scarra-

* *Ephem. N. C.* An. 6. *Ob.* 9. *p.* 187.

† An. 9. in Append, p. 249.

muchi, claims a particular attention, on account of the symptoms being so strongly marked. A young man, in a paroxysm of rage from some domestic troubles, bit the index finger of his left hand, at about eight o'clock in the evening. On the next day at four o'clock, P. M. he was seized with slight shiverings, accompanied with a vomiting of bile. At this period he experienced a dread of water*, and every other kind of liquid—nor was he able to bear the sight of polished and strongly illuminated objects. To such a degree was the abhorrencc of water felt, as to occasion a sense of suffocation at the bare mention of it. He afterwards became delirious, spitted upon the by-standers, and was with difficulty restrained by violent coercion from injuring them. He vomited large quantities of bile, and a dark colored fluid. His strength sunk gradually, and he expired in the space of a few hours†. Johan. Hen. Brechfeld has related the case of a gentleman, who was seized with Hydrophobia in

* "Versus horam 16 aquam, omnemque alium liquorem, necnon corpora lucida et candida abhorrescere incepit, ita ut etiam ad aquæ mentionem strangulari videretur."

† Act. Hafniens. An. 1682.

so violent a degree, as not to be able to swallow the smallest portion of any liquid. He had no difficulty in swallowing solids. On the third day of the disease he spitted at the by-standers; and suddenly expired in his chair on the next day, after an attack of one or two general convulsions. Upon a strict enquiry being made into the cause of his complaint, and particularly with respect to his having been at any time exposed to infection from a mad animal; he declared, when perfectly rational, that he could not recollect such an event to have happened*; nor was he able to assign any cause for the origin of his disorder. I consider the following case related by Dr. M. Lister, † as deserving particular notice. If it be not considered an instance of Hydrophobia, occurring without the agency of the canine poison, we must be compelled to grant, that the bite of a dog proved infectious when no symptoms of disease had appeared in the animal at the time the wound was inflicted, nor for six weeks afterwards. The writer of the case has not made us acquainted with

* "An a cane rabido demorsus unquam fuerit? A me interrogatus (cum mente adhuc constanti) se id non meminisse aiebat."

† Tract. de morbis quibusdam chronicis. Histor. I.

the fate of his animal at any subsequent period. Now that a rabid dog should be capable of communicating the infection, previous to any symptom of the disease having discovered itself, is in direct opposition to general opinion. It is likewise equally repugnant to particular experience*, and to the analogy to be observed in the operation of most other infectious diseases. Besides, the length of time (above six weeks) from the bite, to the death of the patient, exceeds the general period as-

* In order to obtain satisfactory information on this point, I wrote to Hugo Meynell, Esq. whose knowledge on the subject of the diseases of dogs must be superior to most others, from his long experience and attention to whatsoever regards their health and safety. He obligingly returned the following answers to some queries I had proposed.—1st. "Madness generally appears between a month and six weeks after the bite; about a fortnight is the shortest, and eight months the longest period I have known it to appear in after the bite." 2d. "I know no instance of a dog apparently in good health having communicated the disease; but I have known the disease to have been communicated by a dog that, to one who was not a nice observer, or was not well acquainted from experience with the symptoms of canine madness, might have appeared in perfect health." 3d. "I am not acquainted with any instance of a dog having apparently recovered, and then relapsed, after the symptoms of the disease had once appeared."

signed

signed for the fatal termination of madness in dogs. Doctor Hunter *, in his ingenious paper on this subject, observes, that the disease generally proves fatal to dogs *in three weeks.* Is it not then a little extraordinary, that Doctor M. Lister should have expressed no doubts relative to the power this dog had of communicating the infection, when he confesses the animal appeared free from any symptom of madness, at the time the patient died †? I shall quote such passages, from the history of this case, as will certify, beyond dispute, the identity of the symptoms with those usually exhibited in canine madness. A young man was slightly bitten in the arm by his own dog. The animal returned quietly home with him on the same evening. The wound was suffered to heal spontaneously. About forty days after the accident happened, the patient was seized with flying pains over his whole body; but especially about the region of the præcordia. On the day following he was troubled with a

* See Transactions of a Society for the improvement of medical knowledge, Vol. i. p. 295.

† "Neque illud silentio prætereundum est, ipsum canem a quo morsus est, hominem eâ nocte secutum esse; imo *ipse canis vivus et sanus esse* vicebatur, quo tempore homo mortuus est."

constant

constant inclination to vomit, attended with violent twitchings at the stomach. With great difficulty he was able to swallow his saliva. He refused to drink some water which Doctor Lister presented to him. His countenance now exhibited great distress. He was able to swallow solid food when presented in a spoon. On the fourth day these symptoms had increased to the highest degree: To swallow his spittle now became so dreadfully difficult, as to threaten instant suffocation. The sight of water was terrible. Every object inspired him with dread. His mind was, however, sufficiently composed to frame his will; and he inspected his book of accounts. He had no suspicion of the nature of his complaint until Doctor Lister made some enquiries. On the same evening he expired strongly convulsed, immediately after making an effort to swallow some beer.

The frequent occurrence of an aversion to fluids, and of great difficulty in swallowing them in women affected with Hysteria, has been noticed by many writers *. Some of these facts demonstrate, that all the symptoms of canine madness have been brought on

* Morgagni, Mead, Schenkius, Platerus, &c.

by

by violent affections of the mind, in irritable and delicate habits. The fatal termination of some of these instances, tends further to confirm the strictness of the analogy between canine madness and hysteria. Platerus * takes notice of a singular instance of Hydrophobia in consequence of terror. A woman, of an irritable state of nerves, was much alarmed at being left alone by her companions on the banks of a river, where she had been employed in washing linen. As the evening approached, her fears increased. After returning home she was seized with a violent sobbing, and was almost in danger of suffocation. These symptoms increased daily; and an utter aversion to fluids supervened. The motion of the air, and the appearance of luminous objects, were equally offensive. She expired under the pressure of these symptoms on the eighth day of the disease. Sauvages † has recorded a

* *Observ. Med.* PLATER, *Lib.* 1.

† "Une servante ayant été vivement pressée par un jeune homme dans le temps de ses règles, cette evacuation s'arrêta, et quelques heures après, le jeune homme ayant renouvellè ses tentatives, la fille entra dans une espéce de fureur. Dès ce moment elle se plaignit de douleurs vagues par tout le corps, et ces douleurs furent suivies d'une fièvre ardente, et d'un delire si violent, qu'il

a fatal example of Hydrophobia in a young woman, in consequence of the mind being violently agitated, during a morbid and irritable state of the body. In this patient, the sight of any kind of fluid produced dreadful convulsions, and it was not possible to prevail upon her to swallow any medicine. The patient died three days after the accident. A variety of cases might be cited, in proof of the strict similarity between the symptoms of Hysteria and Rabies Canina from the Ephemerides N. C. I shall content myself, however, with having stated the above; and proceed to draw some inferences from the general recital of preceding facts.

I. That the poison of a rabid animal may lay dormant in some instances for the period of twelve, and even twenty months: yet that the cases related by various authors, where canine madness is said to have occurred at the distance of *seven, twenty,* and *forty years,*

qu'il fallut lier la malade. Ces accidens furent suivis de *l'hydrophobie la plus decidée.* A la vue de toute espèce de liquide, la malade tomboit dans des convulsions affreuses; elle rejetoit jusqu' aux alimens solides, et il ne fut pas possible de lui faire aucun remede. Elle mourut trois jours après son accident."

SAUVAG. *Nosol.*

from

from the communication of the poison, may be justly considered as either instances of spontaneous Hydrophobia, or of such diseases as occasionally exhibit the anomalous symptoms—of an inability to swallow fluids, and an aversion at the sight of them:—The poison of a mad animal has had no share in their production. II. That the mere application of the saliva of a rabid animal to the skin, especially to those parts where its structure is of a thin and delicate texture; such as the lips, tongue, &c. has produced the disease of canine madness; but that the inspiration of the breath of a mad animal by any person, has ever produced this complaint appears highly improbable, and is not supported by positive facts. III. That local irritation from wounds in irritable habits, especially when conjoined with a perturbed state of the passions; and, also violent affections of the mind, independently of corporeal injury, in hysterical and hypochondriacal constitutions, have produced all the pathognomonic symptoms of canine madness; and finally, that violent alternations of heat and cold, and all other causes, which induce great debility, and at the same time increase the irritability of the system, have at times proved adequate to the pro-

production of symptoms, exactly corresponding with those of Rabies Canina. Perhaps the following observations may tend to elucidate, more fully, the propriety of adopting the above inferences.

I. I conjecture that those writers who noticed the occurrence of canine madness at the distance of seven, twenty, and even forty years, from the supposed communication of the virus, have either been mistaken, in considering the anomalous symptom of an inability to swallow fluids, which is sometimes met with in fever, hysteria, and other diseases, as an effect of the animal poison; or have been ignorant that Hydrophobia has occurred in particular habits, without the possibility of assigning any specific cause for its production. Moreover, it is a fact founded on the observation of a considerable number of cases, that upon the average, not more than one* person, out of twenty-five who have been certainly exposed to the bite of a mad dog, has become infected with the disease. Therefore, when symptoms of Hydrophobia have

* See HAMILTON's Treatise on Hydrophobia; Dr. VAUGHAN's "Two Cases of Canine Madness;" and Dr. HUNTER's Paper on this subject in the Transactions already quoted.

appeared

appeared at the distance of many years from the bite of an animal really infected, no positive conclusion can be drawn from this circumstance; as the disease is by no means a certain consequence of the bite. II. Notwithstanding the host of negative facts which may be brought to disprove the occurrence of infection from mere contact of the saliva with the skin, yet the positive facts already quoted from good authorities are of such force, as to stamp conviction on the mind, of the possible, though rare occurrence of canine madness from this cause. If this conclusion be just, may we not imagine in some cases, where the poison is said to have manifested itself after a very long interval from the bite of a rabid animal; and, indeed also in some of those cases which have been considered altogether as spontaneous, that the poisoned saliva may have been *recently* communicated, either indirectly, through the unsuspected medium of the cloaths, or directly, by fondling * or playing with an animal, not known to have been

* It is not possible to use too strict precaution in avoiding a familiarity with strange dogs. Dr. HUNTER, in the work before alluded to, has remarked, that almost all the accidents related to the Society, arose from taking notice of strange dogs.

rabid?

rabid? That such accidents very rarely occur, will be readily granted; yet, as they seem to be within the limits of probability, an important lesson is held forth to medical practitioners, not to neglect those cases where the saliva has been communicated merely to the skin, without any visible injury being sustained. III. The histories of Hydrophobia, related by different Authors, as arising from local irritation of wounds, or from violent affections of the mind, operating suddenly and powerfully on the nervous system, merit a due consideration. The credibility of these histories seems not only to be confirmed, but also the strict analogy between their symptoms and those of canine madness to be farther illustrated, by the occurrence of Hydrophobia in some cases of Tetanus. Facts of this kind have been observed, and commented upon, by two celebrated Physicians*. Doctor Rush† has remarked the joint similarity of some species of Tetanus, with Hydrophobia. Having particularly noticed the symptoms of irritability and debility—and the sense of strangulation felt on swallowing liquids—as occurring in both maladies, he justly inferred, that these

* Dr. PERCIVAL and Dr. RUSH.

† Essay on Tetanus—Medical Inquiries, v. 1.

diseases

diseases were nearly related in their proximate cause of nervous irritation, and therefore required the same mode of cure. With equal sagacity, and by a striking coincidence frequently to be met with among men of talents and observation, Doctor Percival * had pointed out the same resemblance between these diseases, and had also suggested a similar mode of cure, previous to the publication of Dr. Rush on this subject. Both these Authors have produced several cases to confirm their opinions. The following striking instance of similitude between Tetanus and Hydrophobia was communicated to me by Dr. Percival. The case occurred since the publication of his valuable observations on canine madness, and was sent him through the medium of Dr. Haygarth. Mr. Wilmer of Coventry, well known by his many ingenious works, attended the patient, and furnished the description of the case.—"A young gentleman, pupil to a Surgeon of this town, had the middle finger slightly wounded by a splinter of wood, on its internal edge, and just over the part where a nerve accompanies the artery to the end of the finger. In about a week the little wound healed. A day or

* Essays Med. and Experim. Vol. II.

two

two after, he complained of a stiffness in his throat and neck. This he attributed to his having taken cold. The complaint increased, and extended to the muscles of the face and jaw. The muscles which move the lips were affected with spasms. A pain was felt about the scrobiculus cordis. In three days the lower jaw was locked. The convulsive motions of the muscles of the face recurred only at intervals. He had taken, during the three first days, Tincture of Opium with Camphor Julep, in large quantities. On the third day his lower jaw was less fixed, but he could take no more of his fluid medicine; and all watery drinks he found impossible to swallow. Whenever they approached his mouth, the convulsive spasms of the face returned, and his head was forcibly drawn backwards. He was now ordered opium in a solid form, which was persevered in without effect. Clysters of asafætida, opium, &c. were repeatedly given. The nerve leading to the part affected was divided transversely with the knife. On the fifth day he appeared somewhat better, when we were hastily called to him, as he was supposed to be dying. Universal convulsions (during which the mucus was plentifully collected in the corners of his mouth) seized him,

him. In the space of twenty minutes the spasms ceased. Electricity was proposed, and tried. After he had received a few shocks, the convulsions returned, and in less than ten minutes he died. Dr. Simson, Mr. Cole, and Mr. Whitwell, as well as myself, attended him; and we were all of opinion, that if the symptoms I have described had followed the bite of an animal, instead of the injury done to his finger by a splinter of wood, we should have had some difficulty in determining whether the disease was Tetanus or Hydrophobia. About ten years since I attended a patient, whose symptoms were nearly similar to those above related, and which were the consequence of a bite from a horse. After opium, and other antispasmodics, were ineffectually tried, he recovered by the use of electricity."

If there were any necessity for additional proofs of the occurrence of Hydrophobic symptoms, in cases of local injury, a variety of instances might be brought forward, from Hildanus, Cœlius Aurelianus, Schenkius, and other writers. But the fact seems to be sufficiently established. It appears then, that the occasional causes productive of spontaneous Hydrophobia, operate either locally or generally

generally upon the nervous system, by increasing its irritability, and at the same time inducing debility. It is also sufficiently evident, that the action of the canine poison produces similar effects. But its superior mischievous activity, in comparison with any other occasional cause, cannot be denied. Yet I apprehend we ought to attribute the more fatal virulence of the canine poison, rather to the difference in degree, than in the nature of the cause. For undoubtedly, the identity of effect warrants the conclusion of an identity of the cause. Happy would it be for the patient, as well as grateful to the practitioner, if farther practical experience in the mode of cure, should confirm the truth of the above inference!

In the *Act. Norimberg.* Tom. II. there is a case of Hydrophobia related, in which all the symptoms of canine madness were combined with Hysteria. A cure was effected by the exhibition of tonic and antispasmodic medicines. Doctor Nugent's extraordinary case of Hydrophobia affords a similar proof of the efficacy of these remedies.

In both these instances, the symptoms appeared altogether in as violent a degree as in any case of canine madness. We may then rationally

rationally expect, that application and perseverance will at length discover a remedy sufficiently powerful to counteract the virulent effects of the canine poison.

From a review of the whole of the preceding facts and observations, are we to consider the unhappy case prefixed to this enquiry, as arising from the bite of a rabid animal, inflicted twelve years since; or may we, with more probability, attribute the disorder to some unobserved or forgotten communication of the canine poison with the skin; or, finally, must we not be compelled to view this case as a genuine instance of spontaneous Hydrophobia? It is with diffidence that I incline to the last opinion. But when I reflect that we have no authentic testimony of the canine poison lying dormant more than twenty months at farthest; that Hydrophobia, with all the pathognomonic symptoms of Rabies Canina, has been produced by other occasional causes than the infection of a rabid animal; and also that notwithstanding a person should have been really exposed to the canine poison, the chances are greatly in favor of his not being infected.—I am compelled to conclude, that this patient fell a victim to other causes, than the poison of any rabid animal. Nor do

I conceive that the effects detailed in this case are disproportionate to the power of the supposed causes. We ought to consider the melancholic temperament of this patient, so much predisposed to mental and corporeal irritation —the weight of his affliction at the heart-rending prospect of his family's distress—his unremitted, but ineffectual, efforts to remove these calamities—and the scanty portion of sustenance he allotted to himself, during this almost unexampled struggle of strenuous exertion, against famine, debt, and despair! Add to these circumstances, the effects of imagination in aggravating the violence of the disease. For, although the patient's dread of liquids did not arise from this cause, as he felt a difficulty in swallowing them previous to being impressed with a remembrance of his having been bitten by a supposed mad dog, yet the moment this idea took possession of his mind, he considered his recovery as hopeless. The image of the dog haunted his imagination with perpetual terrors; and the expectation of a violent death, by being smothered, (a vulgar and unjust persuasion too often entertained) would not a little tend to increase the nervous irritation already excited. I have before mentioned, that this

case,

case, from the disease being in a very advanced stage, was considered as irremediable. Nevertheless, such remedies were administered as are usually recommended in the cure of this complaint. Among these the external and internal use of oil were tried; but indeed, at so late a period, as not to afford any great expectation of relief being obtained. It may not be improper to mention here an idea that occurred to me on reading the two cases related by Doctor Shadwell*, in which he trusted solely to the exhibition of this remedy. In one instance it proved successful, but failed in the other. Dr. Shadwell attributes its failure in the case of the boy, to the difficulty he experienced in swallowing it, joined to an extreme repugnance to make the attempt; so that only a very small portion (in comparison with what the man took) could be forced down. As this difficulty of swallowing fluids, and consequent aversion to them, arises from the morbid irritability of the fauces, and muscles subservient to deglutition, I conceive, that the impediment to the use of oil, (as well as other fluids) might be overcome, by adopting the same mode of administering

* Memoirs of the London Medical Society—last vol.

it, as was practised by the late Mr. John Hunter *, to convey food into the stomach of a patient who was afflicted with a Paralysis of the Œsophagus, and consequently was unable to swallow any nutriment. By this mode the oil could not come in contact with the irritable parts of the gullet, but would immediately enter into the stomach, and thereby afford to the patient that chance of relief which the remedy has been said to have effected, at least in one instance. It is well known that the Antients relied greatly upon

* "The instrument made use of was a fresh eel skin of rather a small size, drawn over a probang, and tied up at the end where it covered the sponge, and tied again close to the sponge where it is fastened to the whale bone, and a small longitudinal slit was made into it just above this upper ligature. To the other end of the eel skin was fixed a bladder and wooden pipe, similar to what is used in giving a glyster, only the pipe large enough to let the end of the probang pass into the bladder without filling up the passage. The probang thus covered was introduced into the stomach, and the food and medicines were put into the bladder, and squeezed down through the eel skin. But as cases of the kind may occur where eels cannot be procured, a portion of the gut of any small animal, as a cat or a lamb, will make a very good substitute." History of a case of Paralysis, &c. in the Transactions already quoted.

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the use of this remedy. Cœlius Aurelianus *, among other antient writers, recommends its use; but was aware that in most cases it could not be swallowed, and therefore orders its exhibition by another mode.

Since I entered on the discussion of this part of my subject, I have read with great satisfaction an account †, by J. Williams, Esq. of the surprising efficacy of a remedy against the deleterious effects of the bite of several snakes; and especially of the Cobra de Capello. These facts are not only interesting, as pointing out a certain and simple mode of rescuing those exposed to the bite of these venomous reptiles, from almost inevitable death, but also highly deserving attention, as they demonstrate an analogy between the symptoms arising from the poison of some snakes, and those produced by the bite of a rabid dog. And surely, in the treatment of so fatal a disease as canine madness, it is proper to adopt any method of cure founded upon rational principles. Analogy,

* "Quod ita facere poterimus, si calidam atque oleum clystere per podicem injiciamus; et si fieri poterit, diurnis diebus, parvem quidem tunc enim poterit contineri."

CŒL. AUREL. *lib.* 3, 231, *de morb. acut.*

† Asiatick Researches, vol. II. p. 323.

under

under these circumstances, seems to be our surest guide.

The author of this discovery has detailed several cases, selected from a variety of others, which terminated with equal success. His method of cure entirely consists in the external application to the bitten part, and internal exhibition, of the spirit of the caustic volatile alkali *. Eau de Luce (which is generally at hand) answers as well; but he, with reason, prefers the pure caustic alkali, when it can be readily met with. This remedy has uniformly put a sudden stop to the baneful effects of the poison of the Cobra de Capello.

The action of this poison seems to be chiefly confined to the nervous system, and resembles that of the canine virus, in exciting convulsive spasms about the throat and fauces †, difficulty in

* The "*Aqua ammoniæ puræ*" of the College Dispensatory.

† Case 2d. p. 325.

"In July 1782, a woman of the Brahmen cast, who lived in my neighbourhood at *Chumar*, was bitten by a Cobra de Capello, between the thumb and fore-finger of her right hand: prayers and superstitious incantations were practised by the Brahmens about her till she became speechless and convulsed, with locked jaws, and a profuse discharge of saliva running from her mouth. On being informed of the accident, I immediately sent a servant

in swallowing, and a flow of saliva from the mouth. Whether the remedy acts specifically, by destroying the quality of the poison, or generally, by stimulating the nervous system, cannot with certainty be determined. But I am inclined to adopt the latter opinion. At all events it is abundantly proved, that the effects of a most deadly poison (which acts violently on the nerves) have been counteracted by the operation of a certain medicine, There is, therefore, sufficient reason to hope, that its exhibition in canine madness may be attended with salutary effects. For, if two distinct kinds of poison, generated by different creatures, produce similar phænomena in the human constitution, we may fairly conclude that these effects originate from the same proximate cause. There will certainly be great, if not insuperable difficulty, in administering caustic volatile Alkali Spirit (necessarily diluted with a portion of some mild and insipid liquor) in Hydrophobic cases, where the increased sensibility of the fauces

servant with a bottle of volatile caustic alkali spirit, of which he poured about a tea-spoonful, mixed with water, down her throat, and applied some of it to the part bitten. The dose was repeated a few minutes after, when she was evidently better, and in about half an hour was perfectly recovered."

to

to irritation, and the dread of liquids, are so strongly felt. Perhaps it would be advisable, in such cases, to mix the volatile alkali with crumbs of bread, and form the mass into bolusses.

Since the publication of the foregoing case, and remarks; my attention has been again called to the subject. I have had the melancholy task to record a genuine and fatal case* of Rabies Canina. In this instance there was no room for doubt as to the cause of the malady. The history was complete in all its parts. The bite, the Hydrophobic symptoms, the fatal event, followed in regular succession. All confidence in the usual routine of practice having been destroyed, recourse was had to some powerful and untried means.—These alas! succeeded no better in averting the sure catastrophe—But although the practice failed in curing the disease, it seemed to mitigate the sufferings of the afflicted patient—For further detail I must refer to the work in which it was published. I have now adverted to the history of this patient from a two-fold motive:—First, because it has served to strengthen my former opinion, *viz.* that Lind-

* See Medical and Physical Journal Vol xiii. p. 155

say's

say's case exhibited all the genuine symptoms of Canine madness:—For if we compare the history of the malady in each patient, we shall find an exact resemblance in every point but one, *viz.* The disease in Lindsay was more *decisively characterised.* This may be attributed to his peculiar temperament, time of life, and the suspicion he entertained of the nature of his malady. 2dly, This last decisive instance of the dire effects of the Canine poison (being the third case of Hydrophobia which has fallen under my observation) aroused my attention to a more close investigation of the facts and analogical reasoning upon which the scheme for the extermination of Canine madness is founded. But before I enter upon this discussion it may not be improper to make some additional remarks on Lindsay's case, as well as the general subject of Hydrophobia. Some writers have lately revived the objections formerly brought forward by Salius, Mead, Sauvages, and others, against the use of the *term* HYDROPHOBIA. They contend that the difficulty of swallowing fluids precedes the aversion from them, and therefore either the term βραχυπνοτεα or Δυσκατάποσις, both implying a difficulty in swallowing is more correctly descriptive of the leading symptoms of Rabies than Υδροφοβία a dread

dread of water. They likewise assert, that the affection of the throat, or dread of liquids, is only an *accessary* symptom, and by no means characteristic of the disease. The existence of such a disease as *spontaneous Hydrophobia* they altogether deny; and will not even allow that in any instance symptoms resembling those of Rabies canina have occurred without the influence of the canine poison—I shall briefly notice these objections in the order they stand. It is in my opinion, of slight importance which of the terms alluded to should be preferred, so long as it is acknowledged, that the peculiar affection of the throat, which excites both a horror of fluids and a difficulty of swallowing them, (and *that* unconnected with any apparent obstruction of deglutition) is a leading and characteristic feature of the complaint. But when an attempt is made to convert this diagnostic symptom into one of inferior importance, it then becomes a question of great practical moment, and as such deserves farther discussion—The facts and observations brought forward by Dr.*. Mease (which have been adopted, and only in *one instance* added to, by a subsequent writer) with a view to esta-

* See *Mease* on *Hydrophobia*: passim.

blish

blish this position, are, I conceive, by no means decisive. They rest solely upon the following evidence. 1st. The bare assertion of a Physician in Shropshire, who informed Dr. Mead, that he had seen three Hydrophobic patients, in one year, who had never experienced, during the disease, any difficulty in swallowing, or shewed any signs of dread of liquids. 2dly. Dr. Houlston's case, where it is mentioned that during an interval of sixteen-hours which took place in the disease, liquids were swallowed freely:—A similar instance is also quoted from Dr. Dickson, of a patient who drank several cups of tea in the last stage of the malady. Finally, a newspaper paragraph is brought forward of a person laboring under Hydrophobia, who, to the astonishment of the attending medical faculty, drank freely of liquids during the progress of his complaint. I shall pass over this last testimony as not deserving a moment's consideration.

1. The communication to Dr.* Mead was from an anonymous practitioner, who does not appear to have entered into any particulars of the histories of the cases which he treated. Such sort of testimony is at all times to be ad-

* See Mead on poisons.

mitted

mitted with caution; but especially when, as in this instance, it *affirms too much* to deserve any credit for correctness and authenticity. For is it to be conceived that any person should meet with *three* genuine cases of Rabies canina in the course of one year, in all of which, neither a horror of fluids, nor difficulty in swallowing them occurred; when there is not (I can almost venture to assert) one single unequivocal history upon record, where one* or the other of these truly essential symptoms has not been noticed in some one stage of the disease?—I appeal for the truth of this assertion to an examination of the hundred and twenty-one cases which are referred to by† Dr. Hamilton, although all of them perhaps are not of equal authority. Upon consulting these histories I found, with only one exception, (which shall be presently noticed) that either the symptoms of *aversion* from, or that of a difficulty in swallowing liquids, was universally stated to have occurred

* I have not been able to meet with more than two cases upon record, where the difficulty of swallowing was *unaccompanied* with the symptom of *Hydrophobia*: such very limited exceptions serve strongly to confirm the general rule.

† Hamilton, on Hydrophobia, Vol. I. p. 115.

during

during some one period of the disorder.—Such a mass of facts, derived from various authorities, and occurring at the distance of many centuries (and which are only contradicted by hearsay and equivocal testimony) must carry conviction to the mind of every unprejudiced enquirer.

2. There can be no doubt that many Hydrophobic patients (I have myself recorded the fact in two instances) just before the agonies of death, and sometimes even at an earlier period, have been able to swallow liquids with comparatively little distress. But because there is, in some cases, an occasional abatement of Hydrophobia, it is not surely to be inferred that in others it is wholly absent? In * Dr. Dickson's patient the most decided dread of fluids occurred on the second day of the disease; and it was only "*ten minutes before his death*" that he drank "*one cupful of cold tea;*" and *not* "*several cups* at the latter end of the disease," as is inaccurately quoted by Dr. Mease.—If then the evidence brought forward by this writer be deemed inadequate to prove the entire absence of Hydrophobia in cases of canine madness, the fact solely rests (as far as my acquaintance with the subject extends) upon the solitary instance recorded by† Hildanus. But if the

* Med. obs. and Inq. Vol. III. p. 368.

† P. 365. Observat. 88.

history

history of this case be candidly and carefully examined, there will be reason to doubt, whether it ought to be brought forward as an exception to, what may be justly termed, a general law of the disease. The violent rigor, high degree of fever, obstinate constipation of the bowels, attended with excessive pain, added to which, the unprecedented fact of the patient passing the whole of the fifth night from the attack, in *undisturbed** sleep, by the aid of laudanum; and above all, the† absence of Hydrophobia, which, according to Hildanus, "præcipuum et verissimum symptoma est morsus rabidi;" all these circumstances combined, have led me to suspect that this patient's malady ought to be attributed to some other cause, than the bite of a rabid animal.

Having I trust sufficiently demonstrated, that Hydrophobia is an *essential* and characteristic symptom of Rabies in the human frame. I shall now advert to the observations against

* "There is no sleep from the beginning of the fever to the end."

MEAD *on poisons*

† This Hydrophobia has always been accounted the surest sign and mark of this poison, by which it is distinguished from all other diseases."

Ibidem.

the

the existence of *spontaneous Hydrophobia*. It is confidently asserted, there never existed in any case, the marked and decided characteristic symptoms of genuine canine madness, without the intervention of the poison of a rabid animal; and therefore it is contended, that the assumption of such a title as *spontaneons* Hydrophobia is calculated to divert the attention from sober enquiry, and to involve a subject sufficiently obscure in still greater darkness. I readily accede to the justice of the remark, as it applies to the meaning which some of the older writers seem to have affixed to the term: *viz.*—That a specific virus, resembling the canine, is spontaneously generated into the human system,—Such an Hypothesis is alike unsupported by fact or analogy. But that several of the instances already noticed in the foregoing pages (among which I particularly include the case of Lindsay, and that recorded by Dr. M. Lister) do most unequivocally exhibit the pathognomonic symptoms of Rabies Canina, will not, I presume, be disputed by any one, who has either seen the disease, or studied its history. They who, therefore, deny, that a train of symptoms, exactly corresponding to those of Rabies Canina, can arise in the human subject, without

out the intervention of the canine poison, must of necessity attribute Lindsay's disorder to the injury he sustained *twelve years ago*, from a dog supposed to have been mad. But this opinion is not confirmed by other facts of a similar kind. For I trust it has been already shewn, that no credit is due to the many marvellous histories recorded by various authors on this head. I am happy indeed, to learn, that several eminent * practitioners have coincided with me in the belief of Lindsay's disorder having had no connection whatever with the bite of a supposed rabid dog. The contrary supposition is so much calculated to excite dreadful apprehensions for the safety of those persons who have been exposed to the chance of infection, that I have thought proper to quote some passages from the letters of † my correspondents, which no doubt will be

* Dr. Hamilton, whose indefatigable labors and ingenuity have thrown great light upon the subject of Hydrophobia, is decidedly of this opinion.

Vide—Hamilton on Hydrophobia, Vol. I. p. 263.

† The late Dr. Darwin writes, "I am inclined to believe with you, that the case you describe was not owing to the bite of the dog, but to the distressed mind, and disease of the body, induced in consequence of exhaustion, by continued labor, hunger, and want of sleep."—Dr. Haygarth remarks, "there are several doubtful

be received with the attention due to such respectable authority.

On the Origin of Canine Madness; and the Means of extirpating it from this Kingdom.

In entering upon this discussion, I shall avoid the controversy respecting the* antiquity of Canine madness, as it would lead me into a labyrinth, without any hope of speedy extri-

doubtful points relative to the nature of Hydrophobia, does it occur spontaneously? you answer this question in the affirmative; and I think judiciously. You very properly disbelieve that the poison in Lindsay's case operated at the distance of twelve years"—Dr. R. Pearson observes—"There is a great similarity between the case of your patient and that of the American woman in Duncan's Commentaries, to which I have referred; as in the latter so in the former case also, I concur with you in opinion, that the Hydrophobic symptoms were not the effect of absorbed virus."

* The antients were much divided upon this question. Cœlius Aurelianus has arranged the different arguments brought forward by each party, to confirm or confute the high antiquity of this disease, in a perspicuous and impartial manner. Upon the whole he seems inclined to agree with those, who maintain the disorder to be of remote and unknown origin; and consequently not first noticed, according to Plutarch and others, about the time of Asclepiades, *i. e.* a hundred and six years before the Christian æra.

Vide, Cœl. Aurelian. lib. iii. de morb. acut.

cation. My chief object will be to enquire into the sources from whence the canine race derive this malady, and the laws by which its communication is regulated; and then to draw such conclusions as may be warranted by an appeal to facts, and the legitimate principles of analogy. Most writers agree in opinion, that this infection originates only in three species of the Genus Canis, *viz.* dogs, wolves, and foxes,—But as the dog from obvious causes, is the animal to whom observations on the subject of Rabies have been chiefly directed, and from whom, danger of infection to mankind most commonly arises, I shall confine my remarks to this particular species.

It may not be improper here to remark that the disease is universally allowed to be contagious; that the infection is communicated by the introduction of a specific virus into the animal system; that the power of propagating the infection is confined to the canine and feline tribe; and that the poison seems to reside in the Saliva or fluids secreted in the mouth and fauces. Neither the human subject, nor the whole range of domestic animals when infected, (with the exception of the cat) appears to be capable of * transmitting the virus. But

* See the authorities quoted in the foregoing pages. Also Hamilton and Mease on Hydrophobia.

although

although there be little or no disagreement respecting the infectious nature of the Canine poison, and the boundaries by which its propagation is limited, still there exists a great diversity of opinion concerning the mode of its generation in the animal system—On this point, two different opinions have been entertained by medical writers: one party while it contends for the efficiency of various remote causes—*viz:* climate, diet, &c. in producing the germs of this disease: yet does not deny that it is easily communicated by contagion: another maintains the actual infection from a diseased animal, by an inoculation of the poison, to be the *sole* exciting cause. The former opinion has been universally adopted by the antient, as well as the generality of modern writers*—The latter has been sanctioned by several respectable medical characters, who published in 1793 Hints on Hydrophobia in a vol.† of Med. Mem.—With a view to ascertain which of these two different opinions are best founded, I shall proceed to enquire into the facts and analogical reasoning

* *Vide*, Opera, BOERHAAVE—et Van Swieten Commentar. Aph. 112.

† *Vide*, Dr. Hunter's paper in the Transactions of a Society for promoting Med. Knowledge.

by which each is supported. They who contend for the spontaneous origin of the disease in the canine race; or in other words, refer its generation to the influence of certain remote causes, which operate upon the peculiar system of the animal; have generally arranged them under the following heads, *viz.*

1st. Putrid Aliment,
2nd. Climate,
3rd. Deficiency of Water,
4th. Want of Perspiration,
5th. Worm under the Tongue,

I shall examine these alledged causes of rabies in the order laid down; and endeavour to shew the great improbability of their possessing the influence, either in a separate or combined state, which has been so generally attributed to them.

1. *Putrid Aliment.* This kind of diet has been supposed peculiarly favorable to the foundation of the disease. It is a favorite hypothesis with those who imagine the canine virus to partake of * alkaline properties, but it is unsupported by a single conclusive fact. On the contrary it is well known, that hounds are fed for the most part on horse flesh, and other carrion, which is often in a state of

* See MEAD's Works, London Edit. 1762, p. 81.

putridity;

putridity; and yet whole packs of dogs have escaped infection for a series of years. Besides we are assured, that, in * Countries where canine madness is unknown, the dogs almost entirely feed upon putrid animal flesh. This happens at the Cape of Good Hope, and in the interior, amongst the Kaffers; where the heat is so great, as to cause putrefaction in an animal that has been killed only a few hours, and which in this state is often devoured by the dogs: yet no such distemper as rabies ever prevails in that † Country. Dr. Mease indeed is of opinion, that although putrid aliment be not capable *solely* of exciting the disease, still it greatly contributes to its production. As the circumstance on which he supports his opinion, is the only one I have met with, where any thing like proof has been brought forward, to substantiate the general position; I shall state the particulars,

* Dallaway in his Description of Constantinople (p. 71) observes that "the only Scavengers of its narrow, ill paved, and filthy lanes, are packs of unowned dogs of the wolf breed, (for none are domesticated) which at night perform this useful office. Amongst such numbers of dogs, it is truly singular, that *canine madness is scarcely known.*"

† See Barrow's Travels into the Interior, from the Cape of Good Hope.

and

and subjoin a few remarks. "At the conclusion of the late war" (in America) the Dr. remarks, "and before that period, all the horses and other animals that died in the City (Philadelphia) were carried out to the commons, and suffered to putrify there; and it is well known, that at this period, madness was a most common disease among the dogs, which used constantly to devour this carrion, but of late it more rarely occurs among them, since the former practice is no longer suffered*."

Taking the fact for granted, as here stated, may it not be as satisfactorily explained by the following supposition, as by that which is given above?—It may readily be conceived, that a number of dogs of every description, and from every quarter of the City, would be collected together to devour carrion in an open and unguarded common.—Now the danger of rabid infection to these animals must be encreased in proportion to the number assembled, and the frequency of their meetings. If only one dog were in a state capable of communicating the disease, what havoc must he make among such a multitude! And what opportunities of spreading the infection must occur

* *Vide*—Mease on Hydrophobia.

when

when the temptation to feed on the same spot was perhaps daily renewed! surely it can excite no surprize, when this unrestrained assemblage of dogs was broken up, that canine madness became less prevalent.

II. *Climate.* This has generally been enumerated as one of the most efficient of the remote, or occasional causes of the disease. From the time of * Ætius (who states that in those Countries where the degrees of heat and cold were equally excessive, canine madness chiefly prevailed) down to the present period, this notion of the effects of climate has been adopted. It is a favorite hypothesis of both the learned and ignorant. It has also the countenance of some late ingenious writers, whose valuable labors have been before appealed to; yet I trust it may be controverted by facts and reasoning, of a kind so directly opposite, as to diminish, if not entirely destroy, any confidence in its probability. Excessive heat is mentioned by most writers as chiefly productive of Hydrophobia. It is true, that the disease is often prevalent in hot climates, and, during the summer months, in temperate regions, like our own; but it likewise frequently rages in cold countries, as in the

* Ætius de Rabie, Cap. VI.

North

North of Europe and America; and it is by no means uncommon, during both winter and summer, in mild and temperate climes. So far, however, from excessive heat operating as an efficient cause of the disease, it is totally unknown in some of the hottest regions of the earth. Don Ulloa affirms, and he is corroborated by subsequent writers *, that canine madness is a stranger to South America. According to the testimony of † Volney, it is equally unknown in Egypt and Syria; and various writers mention, that for a space of forty or fifty years, no dog was ever affected with rabies in the Island of ‡ Jamaica, and some other § of the Western Isles. Mr. Barrow, in the work already quoted, speaks decisively upon the insufficiency of heat to produce the malady. "It is a fortunate circumstance," he observes, "for the Kaffers, and equally so for the Colonists, who are no

* *Vide* VAN SWIETEN Commentar: de BOERHAAVE: Aph. 1129.

† Travels, Vol. I. p. 149.

‡ Transactions of a Society, &c. loc: citat: and Moseley's Diseases of Tropic. Climates, p. 33.

§ "I am informed (says Dr. James in his Treatise on Canine Madness) by a letter from Colonel Martin of Antigua, that no such thing as a mad dog was ever known in the Western Islands."

less

less fond of dogs than the former, that notwithstanding the heat of the climate, the canine madness with its concomitant and remarkable symptom of Hydrophobia, or dread of water, is totally unknown." It cannot indeed be controverted, that the disorder has since broken out in some of the West India Islands, as we have Dr. Moseley's testimony, and that of Dr. Hilary in support of the fact. But heat ought not for a moment to be admitted as the cause of its production, when we find no such disorder existing in hotter regions, and that even in these Islands, it had not been observed for the long space of half a century.

III. *Deficiency of Water.*

Notwithstanding this has been accounted a powerful and very frequent cause of the disease, it does not appear from facts, to be in the least connected with it. No animals suffer more from thirst, in dry seasons, than the dogs in some of the American Islands, where the disease (as has been already proved) is scarcely known.

In Antigua * from the want of springs, water

* Parry Dissertat: Inaugural: de Rabie Contagios: Edin: 1779.

is

is less accessible to dogs than almost any other spot on the Globe; yet there canine madness never prevails among these animals. In the parched desarts of southern Africa, dogs as well as every other animal, often suffer most dreadfully, from a want of this element; but rabies is never found to be the result of this privation. Indeed, facts which so frequently occur within this island, shew the futility of this supposed cause of the disorder. Even during the present uncommonly wet season (January 1807) we hear of a greater number of rabid dogs, than at any other period within the last two years. A similar wet season prevailed during 1794, when forty persons, who had been bitten by mad dogs, applied to the Manchester Infirmary.

IV. *Want of Perspiration.*

Little requires to be said upon this imaginary cause. It was not difficult for Dr. Mead, and other Pathologists, to invent a plausible hypothesis upon this head. They first contend that the dog never perspires, and then infer, that the alkaline properties of this animal's fluids are thereby increased, and thus a ferment is excited in the system, which produces the disease in question. The simple fact

fact of the canine race in many countries, being exempt from madness, completely overturns the hypothesis.

V. *Worm under the Tongue.*

This vulgar error may lay claim both to* authority and antiquity. It is now, however, nearly exploded. Morgagni and other anatomists, have proved, that no such worm exists under the tongues of dogs, but that the substance, so miscalled, is a kind of tendinous ligament.—Nor can the practice of extirpating this substance, by whatever name it may be termed, prevent the occurrence of rabies. Dr. Hamilton justly remarks, that the testimony of Dr. James (who was a celebrated dog-doctor) is decisive upon this point. "Dogs (this Author observes) thus treated, run mad equally with those who have never suffered this absurd operation." Dr. Hamilton likewise appeals to facts † well known in his own neighbourhood, which clearly prove the futility of the operation of worming dogs.

Having, I trust, clearly demonstrated the improbability of canine virus being generated by the operation of any of the remote causes

* *Vide* Nat: Histor: Plinii, Lib. xxix. cap. v.

† Vol. II. p. 271.

just

just enumerated, I shall now endeavour to establish the contrary opinion—*viz.* That the disease is always produced by an actual communication of the poison of an infected animal. This opinion derives strong support both from facts and analogy. I have already shewn that many inhabited* parts of the earth are not infested with this malady; particularly some of the† islands. Their distance from the Continent is the most probable cause of exemption from the complaint. For if the canine poison most commonly discovers itself in dogs within‡ three weeks or a month, its importation into the islands from distant parts would be prevented by the death of the infected animal during the voyage.

* That canine madness is not owing to heat of climate as we are apt to suppose in England, may be inferred from its non-existence in Egypt, in the West India Islands, and other tropical regions, as well as the Cape of Good Hope.

Barrows Travels, loc. citat.

† The Leeward Islands of America, and some in the Grecian Archipelago, (according to Celius Aurelianus) are exempt, while others suffer greatly from the disease.

‡ See Meynell's observations, already quoted, on the length of time during which the poison lies dormant in dogs.

Besides

Besides are we not able to trace the origin of the disease to infection in almost every instance* which

* I have been favored with some important information, the result of experiment and actual observation, from a gentleman who appears to have investigated with an equal share of zeal and sagacity, the subject of rabies in dogs ;—I allude to Walter Trevelyan Esq. of Nether Wilton near Morpeth, who, from his attachment to sporting, and his earnest wish to relieve mankind from the danger of this malady, has directed his endeavours both for its prevention and cure, among the canine species. I shall select from his correspondence such parts as to throw light upon the general subject, and at the same time confirm some of the facts and arguments advanced in the course of this investigation. "I have kept hounds (he remarks) for many years, during which time, I have not had less than fifty couples of them go mad; not a single one could I cure by any medicine that was administered—The Ormskirk remedy was given in doses innumerable; worming under the tongue was also found useless. Sea bathing, large bleedings, and mercury, exhibited in various forms and quantities, were all tried in vain. The notion that the jaw of a mad dog, when wormed, (by drawing out a tendinous or muscular fibre from the under part of the tongue) will fall down and render the animal incapable of biting in consequence of the operation, is entirely erroneous; not but that the jaw of a dog, when mad, may drop down, and be incapable of biting; but by no means owing to the worming, for I have remarked the fact when no such operation has been performed.

Concerning

which comes to our knowledge? Why then unnecessarily multiply causes when one is sufficient to explain the effect?—The dog is a wandering animal, prompted to gratify his

Concerning the origin of the disease among his hounds he remarks, "The first occasion of madness among my pack arose from its being joined when hunting, by a strange dog, who was soon perceived to be mad, but not before he had bitten many of the hounds. Within three weeks after the symptoms broke out, when each hound was kept separate at such a distance as not to be able to bite each other. *They all died mad* at different intervals, according to their constitutions, or strength of the fever." Again he observes "no pack when hunting can be said to be entirely safe, as frequently parts of it are out of sight in woods and covers; some of the hounds are occasionally lost and absent for two or three days, and who can tell what may happen to them? Besides, how much mischief may occur at night from travelling mad dogs, which (as you say and I believe) will go to the distance of fifty miles from home?"

In answer to a query concerning the length of time which takes place between the bite and the appearance of madness in dogs—Mr. Trevelyan states from his own observation "That seven days may be considered a *fair average* of the shortest, and three weeks of the longest period from the date of the bite, to the occurrence of the disease, but this depends upon several circumstances: If a dog be confined, the fever is longer before it shews itself; but should the animal be at large, and hotly pursued, the irritation from an increased circulation of blood brings on the disease much sooner."

natural

natural instincts, he frequently quits his home and traverses a great extent of country. In general, according to a writer often quoted* "we discover some strange dog affected with this complaint communicating it as he passed through towns or villages; and in carrying this research a degree farther, we may be able to find the same dog the property of some person in a distant country; for a dog may wander to a great distance while under this disease in the course of three or four days, even after his knowledge of home and his former connections have deserted him."—It is true we cannot always trace the origin of the malady in any particular quarter in this circumstantial manner—But this is not surprizing, if we consider that the poisoned saliva may be introduced by the slightest and indeed almost imperceptible rasure of the skin,—that dogs are peculiarly exposed by their habits and pursuits to such kind of injuries; and that the poison, when communicated, often lies dormant for† several weeks, sometimes months—The testimony of Mr. Meynell, as founded upon repeated and correct observation, adds

* Dr. Hamilton. p. 154. vol. I.

† See Transactions of a Society, &c.—And Mr. Meynell's observations, loc. citat.

great

great weight to the general argument. This eminent sportsman has preserved for many years his kennel from madness, by making every new hound perform quarantine before he was allowed to join the pack.—But let us also compare the analogy between this and some other infectious diseases—*That* which may be discovered (in many particulars connected with our present enquiry) between Syphilis, the small pox, and canine madness, is too striking to pass unnoticed. All are alike contagious, of uncertain origin, and capable of being checked by due regulations. They prevail in some parts of the globe, and are totally unknown in others—Soon after Syphilis first appeared in the South of Europe, its ravages were so widely extended, among all classes of people, that the poison was supposed to be capable of tainting the atmosphere, and thus producing infection without the least aid of personal intercourse. They who by their rank, sex, and station, were more particularly exposed to disgrace from a detection of the origin of their malady, gladly availed themselves of so convenient a doctrine: but subsequent experience has sufficiently proved the fallacy of this notion.

The small pox is generally admitted to be of

of Eastern growth, and has only been introduced into this Island, within a few centuries. Some * parts of the earth have never been visited by this dreadful scourge. Its ravages, however, even where most prevalent, have been greatly checked, and indeed, exterminated by the establishment of proper regulations, in places favored by an † insular situation. Is it not then highly probable, nay almost certain, that syphilis, and small pox, are solely propagated ‡ by infection? Do not the

* *Viz.* The Southern parts of Africa, many parts of South America, and the Islands of the Pacific Ocean.

† See Dr. Haygarth's excellent "Sketch of a Plan for exterminating Small Pox from Great Britain."—*Passim.*

‡ No doubt there is a distinction between these diseases, in the manner by which infection is often communicated; both are capable of being propagated by inoculation, but the small pox may likewise be imparted by inhalation of the poison in a state of vapor. This is not the case with the syphilitic virus.

Mr. Trevelyan is indeed firmly persuaded, contrary to the established opinion, that the canine virus is equally as contagious as the small pox or measles; and he supports his opinion by the following statement of facts. "After losing my first pack (he remarks) I ordered all the straw to be taken out, the benches to be scalded with boiling water, and all the joints, cracks, &c. to be painted over, and filled up with hot diluted tar; the walls to be white washed, the pavement tho-

the analogies here presented, strengthen the inference, that canine madness is solely a contagious

roughly washed and cleaned with hot water. Being thus secure from infection (as I then thought) I collected another pack of hounds; yet madness occasionally broke out year after year. Thus kept in perpetual alarm, I ordered all the second pack to be destroyed. After having reasoned much within myself on the subject, I took up the idea, that the cause of the infection had not been entirely removed, notwithstanding my former precautions. I therefore ordered the pavement, in which the saliva, or other tainted excretions of the animals might have penetrated and lodged, to be taken up, together with all the earth in which it was bedded, and thrown into the river, and the kennel to be new painted, fumigated, white-washed, &c. and ever after the pack was free from infection. What still further strengthens my opinion of the subtile and contagious nature of the canine virus is the following fact; a Game Keeper, who lived at a distance (eight miles) assisted me daily in dissecting, &c. the hounds which died of madness. It happened once, that when he returned home, not having washed his hands after the operation, he had occasion to attend upon two bitches belonging to his master, that had whelps, which were confined in separate places half a mile distant from each other. When entering their respective kennels, with meat in his hands, they leaped up to smell at it, and instantly appeared disturbed, rubbing their noses among the grass, &c. Both these animals shortly went mad." The above statement is well worthy consideration; and although it do not afford

tagious disease, whose operation depends upon the communication of a specific poison from an infected animal? I am decidedly of this opinion, and have the satisfaction to find it corroborated by the following observation of an enlightened traveller, whose opportunities for collecting correct information in most parts of the globe have seldom been exceeded. Mr. Barrow remarks, "the circumstance of South-Africa being free from the canine madness, and also from the small pox, would lead me to conclude, that neither the one nor the other of these diseases were of spontaneous origin, but that actual biting in the one case, and actual contact in the other, were necessary for their production: whatever may have been the cause which first created those diseases, it would seem such cause has not existed here, or that the climate is unfavorable for its *

ford decisive evidence of the capability of the canine virus, in the form of vapor, to produce infection; nor that the secretions and excretions of a mad dog are all alike poisonous, and may retain their infectious properties for a length of time; yet there is enough proved to excite attention to the facts, and at all events to demand the employment of the means pointed out for purifying kennels, in which rabid dogs have been confined.

* *Vide* Travels into the interior of South Africa, loc. citat.

operation." In order to refute the opinion, that small pox and syphilis originate solely from contagion, it has been triumphantly asked—may not the same causes which originally generated these diseases, be equally operative at the present time? The possibility of this happening cannot be denied, but its probability may justly be called in question. It is manifest, for example, that the first parent of mankind must have been brought into existence in a different manner from his successors: but as an ingenious * writer remarks, " Quisnam vero infantem hodie venere non præunte, aliquando nasci propterea affirmet?" Thus notwithstanding all agree, that small pox and syphilis, must have been generated by other means at some former period, yet but few in the present day, attribute these maladies to any other cause than actual communication of the virus. There is another hypothesis, that was invented by Sydenham, to explain the propagation of the small pox, and other contagious diseases, and which has been since applied to canine madness, by Dr. Moseley. According to this doctrine, most contagious diseases depend upon a peculiar constitution of the air; and

* PARRY.—Dissertatio Inaugural.

to

to this *occult* quality of the atmosphere, Dr. Moseley (and Dr. Mease follows him in opinion) attributes the breaking out of canine madness in Jamaica, during 1783. Dr. M. (as before noticed) admits, that the dogs in this Island had not, for fifty years before this period, been afflicted with the disease. If there had been no attempt to support, by facts, this doctrine of atmospherical influence, in the production of rabies, I should not have noticed a supposition so gratuitous, and ill founded. It is to be regretted, that the author has only *incidentally* hinted at the subject, in his very useful and elaborate treatise on tropical diseases. If the facts had been more fully detailed, and the evidence upon which they rested brought forward to view, a more satisfactory judgment might be formed in regard to the validity of the Author's conclusions. His words are*, "In the spring of 1783, canine madness broke out in Hispaniola, and in the month of June, in Jamaica, where it raged until March 1784. It was said at first, that it was brought from Hispaniola to Jamaica, but experience proved the fact to be otherwise. The common notion, that this disease among dogs can only proceed from the poison of an external bite, or that it originates in

* See Mosely on Tropical diseases, loc: citat:

some,

some particular dog, from internal disease, and from thence is disseminated, has excluded the idea of spontaneous madness, arising from some peculiar influence in the air. But this influence of the air generated the canine madness in the year 1783, in the West-Indies, for it was general, and many dogs were seized with it that had no communication with others; and some dogs, brought from Europe, and North America, which had not been on shore, went mad on their arrival in the harbours of the islands." How many difficult points are involved in this short and peremptory statement? Is it consistent with any of the known laws of contagion? Is there any similar instance upon record, where the atmosphere of a whole Island was so loaded with a specific poison, as to infect the animals which approached the shores? But if we reject the Author's doctrine, how are the phænomena to be explained? I answer; by having recourse to another more consonant to established facts and analogy. "The disease," Dr. Moseley observes, "was said to have been *brought to Jamaica* from Hispaniola, but *experience* proved the fact to be otherwise." I must presume, by the expression of the disease "being brought to Jamaica," that the Author

Author means to imply its importation by dogs laboring under the infection; if so, how did *experience prove the fact to be otherwise?* I suppose the Author would reply, "from the circumstance of some of the dogs, which were brought from Europe, and North America, being seized with madness in the Harbours of the Island." But is this mode of reasoning conclusive? I apprehend not. It has been proved * that the poison in dogs commonly lies dormant for a month or six weeks, and in some instances, even so long as eight months. Why then might not the disease, which had lurked in these animals during the voyage, break out at the period of its termination? But it may be replied in objection, that this explanation is founded on the supposition of so extraordinary a coincidence of circumstances, as cannot reasonably be expected to have occurred. Granted, provided we understand from Dr. Moseley's statement, that a *great number of dogs,* inoculated with the canine virus, had arrived from different quarters of the globe, at the same time, in one place, and that the disease appeared immediately upon their arrival; such an interpretation,

* See Meynell's Observations.

indeed,

indeed, must be considered in the highest degree improbable. But I am not reduced to the necessity of advancing so extravagant a supposition. The writer only asserts, that *some dogs* were thus affected. This is so indefinite a phrase, that I am fairly entitled to consider it as applying only *to few* in number. If the fact really happened, as stated by this writer, (which would require much accurate observation and information, and after all, would be exceedingly difficult, to ascertain) I then should imagine, that a very small number indeed, not exceeding two or three, had become infected. Now if this number bore a small proportion to the whole which was brought over in the different vessels, and that even these went mad at different periods after their arrival in the harbours, the main objections to the probability of the explanation would be done away. But I freely confess, the data which he has furnished, are insufficient to authorize any certain conclusions *for* or *against* his hypothesis. Still as it has been adopted by Dr. Mease, and some other writers, I conceived it proper to shew, what difficulties it involved, and how much remained to be cleared up, before any certain conclusions could be drawn from facts and reasonings, stated

stated in a manner so vague, and so unsatisfactory. Dr. Hamilton, who is staggered by the improbability of Dr. Moseley's statement, attempts to account for the fact of the complaint breaking out in the animals on board the ships, independently of inoculation from a rabid dog, by attributing it to the operation of various remote causes, such as diet, foul air, &c. in the vessels, during the voyage. The incompetency of these supposed causes to produce the disease, has, I trust, been already rendered sufficiently probable. Indeed when we are assured, from undoubted authority, that a whole kennel has been preserved for many years from canine madness, by making every new hound perform quarantine before he was allowed to join the pack; what necessity can there be to have recourse to any other explanation of the origin of madness among dogs, than the actual communication or inoculation of the poison? If a wide spread epidemical constitution of the air could propagate the disease, how did it happen, that Mr. Meynell's pack escaped? From the above rapid sketch of the argument, on both sides the question, I think it will now appear, that the opinion I entertained so far back as 1793*

* *Vide*—Miscellaneous Observations on Hydrophobia. Manchester Memoirs, Vol. IV.

of

of the purely contagious nature of the disease in dogs, and the great probability of its entire extirpation by suitable regulations, is founded upon a fair induction from facts, and close analogies. If then the *kind* of evidence which I have brought forward in support of the argument is the best that the subject will admit; and if it be such *in degree* as to render the doctrine *highly probable*, my object will be attained; for it is upon the ground of having established an accumulated series of probable evidence that I erect the whole of the scheme for extirpating Canine madness from this island. The plan is as simple as I trust it will prove efficacious.—It consists merely in *establishing an universal quarantine for dogs within the kingdom, and a total prohibition of the importation of these animals during the existence of such quarantine*. The efficiency of this preventive scheme rests upon the validity of the following propositions.

1st. That the disease always originates in the Canine species.

2d. That it never arises even in them* spontaneously.

3d.

* As far as Mr. Meynell's *authority* extends, it is decisive in favor of this opinion:—For he states, "I am persuaded that this disorder never originates from hot weather, putrid provisions; or from any other cause but

3rd. That the contagion, when received by them, never remains latent more than a few months.—If these propositions have been established, it clearly follows, that by destroying every dog in which the disease should break out during strict quarantine, the propagation of the malady would not only be prevented, but the absolute source of the poison entirely cut off—I have already dwelt sufficiently upon the two first of these propositions, which I consider to be founded upon highly probable and satisfactory evidence; and with respect to the third, which relates to the exact period of the poison lying dormant, I am not acquainted with a sufficient number of facts to ascertain the time with precision; yet its utmost limits do not certainly extend beyond a few months. Mr. Meynell, in answer to some queries I had proposed, states "madness generally appears between a* month and six weeks after the bite: about a fortnight is the shortest, and eight

but the bite: for however dogs may be confined, however fed, or whatever may have been the heat of the season, I never knew the disorder commence without being able to trace it to that cause; and it was never introduced into the kennel, but by the bite of a mad dog.

* Mr. Trevelyan, as before stated, assigns nearly the same period, from an actual observation of facts.

months

months the longest period I have known it to appear in after the bite."

Dr. Hamilton asserts, from an observation of facts, that three weeks may be deemed an average length of time between the occurrence of the bite and the disease. There is, however, no authority, ancient or modern, that I have consulted which assigns a longer time than eight months, (and this late period forms a remarkable exception to the general rule) or a shorter than ten days, for the appearance of madness in dogs after the bite. Perhaps one month may be deemed a fair average length of time. It would undoubtedly be erring on the safe side, if the time of quarantine should be extended to the very unusual period of eight months. But when we consider the many and great inconveniences attached to a quarantine for so long a period; and that the poison very rarely lurks in the system more than three weeks or a month; a much shorter time may justly be thought sufficient to afford every rational prospect of success. I am indeed persuaded that *two months* would justly answer this purpose; and render it unnecessary ever again to have recourse to a similar expedient. Butthis is not the place to enter into a *detail* of the best means to carry such a plan into effect.

effect. I have no doubt of its practicability, provided the wisdom of the legislature should think fit to adopt it. What I most anxiously wish, at present, is, to engage the attention of the faculty to this interesting subject; so that the propositions I have advanced may be fairly canvassed. If upon investigation they appear to be well founded, and should meet with the sanction of a considerable number of eminent and enlightened members of the profession, it will then be the proper time to lay before parliament the whole scheme in an improved and more detailed form.

So many powerful and obvious motives; interesting to humanity in general, and to this kingdom in particular, may be urged in favor of any rational attempt to eradicate such a terrible foe to human life and happiness, as canine madness, that it may be deemed almost superfluous to hint at this part of the subject. But it is not always the certain knowledge of an evil that leads to due exertions for its removal. We often timidly sink under ills which are erroneously supposed to be irremediable. It is an awful truth that for more than two thousand years, the cure of Hydrophobia has baffled all human skill. What remains then to be done? Preventive

means.

means ought certainly be adopted. After the poison has been communicated, and still lies dormant in the constitution, its effects are often happily obviated by the destruction of the parts where the injury was inflicted. But although this mode must necessarily be frequently ineffective, and always uncertain, our efforts have nevertheless been hitherto confined to so narrow and imperfect a system of prevention. Notwithstanding many of the most enlightened of the faculty have acquiesced in the judicious and well founded plans of Dr. Haygarth, for extirpating small pox from the kingdom; yet, their views have not been extended to the analogy which exists between the variolous and canine poison, in regard to their contagious nature, mode of propagation, and means of prevention. The discovery, by the deservedly celebrated Jenner, of the inoculation of the vaccine virus as an effectual prevention of small pox, has altogether superseded the scheme proposed by Dr. Haygarth. Having already gained the applause and gratitude of all the civilized parts of the globe, on account of the introduction of vaccine inoculation, how greatly would it add to the honor of the faculty of this country, and the nation at large, if such an opprobrium of the medical art,

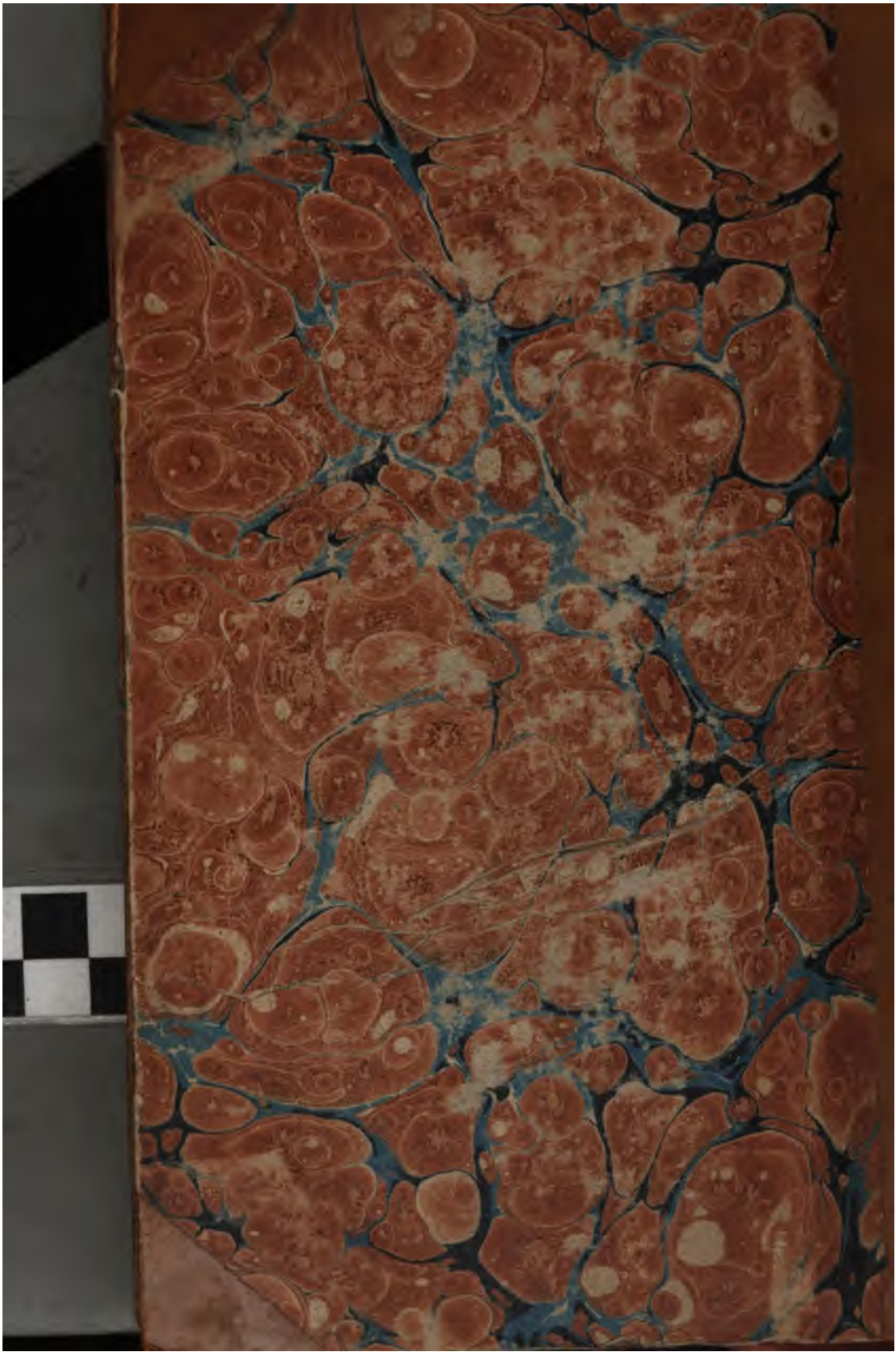
art, and so tremendous a pest to society as canine madness, could be radically destroyed, by aiming at the only source from whence it originates? Our insular situation is peculiarly favorable for the experiment; and the present period most propitious for the attempt. The alarm from the extensive spread of canine madness in the south of England is at its height; and indeed it may be safely affirmed, that some one quarter or other of the united kingdoms is scarcely ever free from the presence of this terrible malady. A ready acquiescence and co-operation on the part of the people may therefore be expected, with any measures of prevention which an enlightened government should enact. So difficult is it to avoid the danger, that all ranks and conditions of people ought to feel equally interested in checking this wide spreading mischief. The dog our companion, and assistant in various occupations, and amusements abroad; and our domestic guard and play-fellow, is not only more exposed to the risque; but is also more susceptible of infection than the human subject. So that taking into consideration the desire of this animal to associate with his own kind, and his constant familiarity with man, it is equally a matter of surprize and congratulation,

tion, that the mischief has not been more generally extended to the human race. Still the evil is great, has been encreasing, and can only be diminished by legislative interference.

The author has been already favored with the sentiments of some distinguished members of the medical profession on the propositions which he has attempted to support. The general result of these opinions is in favor of the doctrine of the contagious origin of Canine Madness, and the probable extinction of the malady, by establishing a system of quarantine for dogs. But as it would require the sanction of a number of respectable persons qualified to judge, before any scheme of this sort could with propriety be submitted to the legislature, the author is very solicitous to be favored with answers (addressed to him in Manchester) to the following queries, from any medical gentleman, who has perused the foregoing remarks, and directed his attention to the general subject.

1*st. Is it not highly probable that Canine Madness in dogs arises solely from the actual communication of the virus?*

2*d. Is not a* few months the longest *period, during which the poison lurks dormant in these animals?*

3*d. Does it not appear sufficiently probable, that a proper system of quarantine, extending to dogs within the kingdom, and to such as may be imported, would be the most effectual means of extirpating Canine Madness from the British Isles?*

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